E-commerce 2023

business. technology. society.

SEVENTEENTH EDITION

Kenneth C. Laudon

Carol Guercio Traver

Chapter-Opening Cases, Insight Cases, and Case Studies

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Insight on Business: Y Combinator's Startup Boot Camp

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Kenneth C. Laudon
New York University

Carol Guercio Traver
Azimuth Interactive, Inc.

Pearson

Content Management: Ellen Thibault
Content Production: Rudrani Mukherjee
Product Management: Marcus Scherer
Product Marketing: Wayne Stevens
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PREFACE

NEW TO THIS EDITION

E-commerce 2023: business.technology. society, 17th edition, provides a thoroughly updated, in-depth introduction to the field of e-commerce. We focus on the key concepts—and the latest empirical and financial data—that will help you understand and take advantage of the evolving world of opportunity offered by e-commerce, which is dramatically altering the way business is conducted and driving major shifts in the global economy.

Just as important, we have tried to create a book that is thought-provoking and current. The 17th edition features the latest developments in business, technology, and society that are impacting e-commerce. We use the most recent data available and focus on companies that you are likely to encounter on a daily basis in your everyday life, such as Meta's Facebook and Instagram, Google, Amazon, Apple, TikTok, YouTube, Twitter, eBay, Uber, and many more that you will recognize, as well as some exciting startups that may be new to you. We also have up-to-date coverage of key topics in e-commerce today, from privacy and piracy to government surveillance, cybercrime, fintech, social-local-mobile marketing, intellectual property, and many more. You will find here the most up-to-date and comprehensive overview of e-commerce today.

The e-commerce concepts you learn in this book will make you valuable to potential employers. Many employers expect new employees to understand the basics of e-commerce, online marketing, and developing an e-commerce presence. Every industry today is touched in at least some way by e-commerce. The information and knowledge that you find in this book will be valuable throughout your career, and after you read this book, we expect that you will be able to participate in, and even lead, management discussions about e-commerce for your firm.

Enhanced Stand-Alone Pearson eTextbook

E-commerce 2023: business. technology. society, 17th edition, is available as a stand-alone eTextbook, which extends the student learning experience anytime and anywhere: The mobile app lets students use their eTextbook on Android and iPhone mobile phones and tablets. The eTextbook engages students with compelling media: Videos and animations written and produced by the authors bring key concepts to life, helping students place what they are reading into context. Other features include highlights that allow educators to share information directly with students within the eTextbook and analytics that let educators gain insight into how students use their eTextbook, thus allowing educators to plan more effective instruction. Pearson's eTextbook platform provides an affordable, simple-to-use mobile teaching and learning experience.

Included in the *E-commerce*, 17th edition, eTextbook are:

- **Interactive Tools**—Students can highlight, take notes, and review key vocabulary all in one place, even when they are offline. Seamlessly integrated interactivities and videos enliven student learning and understanding of concepts.

- **Figure Videos**—Author Ken Laudon walks students through important concepts in each chapter using a contemporary animation platform (12 in total). Available only in the Pearson eTextbook.
- **New Video Cases**—A brand-new collection of video cases (two per chapter, 24 in total) draws from Pearson's extensive library of business and technology video clips. The cases cover key concepts and topics, with associated case material and assessments. Video cases are listed at the beginning of each chapter and on pp. xxix–xxx of the Preface.

New and Updated Topics

The 17th edition features all new or updated opening, closing, and "Insight on" cases. The text, as well as data, figures, and tables in the book, have been updated through September 2022 with the latest information available from industry and government sources. In addition, we have added new, expanded, and/or updated material on a number of e-commerce topics that have appeared in the headlines during 2021–2022, including the following:

- The continuing impact of the Covid-19 pandemic on the Internet and e-commerce (throughout the book and particularly in Chapters 3 and 12)
- Creators and the creator economy; influencers and influencer marketing (Chapters 1, 2, 7, and 10)
- The rise of TikTok (Chapters 1, 7, and 11)
- The metaverse (Chapters 1, 3, 5, 7, and 8)
- Web3 (Chapters 1 and 3)
- Data privacy concerns; Apple's and Google's new privacy initiatives (Chapters 1, 2, 6, and 8)
- Artificial intelligence and big data in e-commerce and online advertising (Chapters 1, 6, and 9)
- Efforts to control Big Tech via litigation, regulation, and legislation (Chapters 1 and 8)
- The impact of the ESG (environmental, social, and governance) and sustainability movements (recommerce, circular economy) (Chapters 1, 2, 9, 11, and 12)
- Blockchain technologies (Chapters 1, 5, 12)
- The impact of the Internet of Things (IoT) on e-commerce, e-commerce business models, and supply chains (Chapters 2, 3, and 12)
- The QUIC protocol as a replacement for TCP (Chapter 3)
- New Internet access technologies, such as low earth orbit satellites and the arrival of 5G (Chapter 3)
- The growing importance of omnichannel retail strategies, including BOPIS/click-and-collect (Chapters 4 and 9)
- Major security issues, such as software supply chain attacks, ransomware, cybercurrency hacks, large-scale data breaches, and hacks related to software vulnerabilities (Chapter 5)
- New alternative payment services such as Buy Now Pay Later (BNPL) services and cryptocurrences, including Bitcoin, Ethereum, and stablecoins (Chapter 5)

- Contextual advertising and first-party tracking as a replacement for behavioral targeting (Chapter 6)
- Social marketing using TikTok and Instagram (Chapter 7)
- Apple ITP and ATT and Google Privacy Sandbox (Chapter 8)
- Web scraping as a copyright issue; efforts to update the Digital Millennial Copyright Act (Chapter 8)
- State regulatory efforts with respect to privacy, Internet sales tax, net neutrality, and online gambling (Chapter 8)
- Carvana and other digitally native direct-to-consumer companies (Chapter 9)
- Fintechs including neobanks, robo-advisors, and insurtech (Chapter 9)
- New streaming services, Gen Z and media consumption, and online gaming (Chapter 10)
- LinkedIn, Facebook algorithms, eBay, Yahoo, and AOL (Chapter 11)
- Supply chain disruption, digital twins (Chapter 12)

SOLVING TEACHING AND LEARNING CHALLENGES

Currency Important new developments happen almost every day in e-commerce and the Internet. We try to capture as many of these important new developments as possible in each edition. You will not find a more current book for a course offered in the 2023 academic year. Many other texts are already six months to a year out of date before they even reach the printer. This text, in contrast, reflects extensive research through September 2022, just weeks before the book hits the press.

Strong Conceptual Foundation: Business, Technology, Society The book emphasizes the three major driving forces that permeate all aspects of e-commerce: business development and strategy, technological innovations, and social and legal issues and impacts. In each chapter, we explore how these forces relate to the chapter's main topic, which provides students with a strong and coherent conceptual framework for understanding e-commerce.

Real-World Business Firm Focus and Cases From Amazon to Google, Microsoft, and Apple; to Facebook, Instagram, TikTok, Twitter, and LinkedIn; to Netflix, YouTube, and Hulu; to Uber, Lyft, Instacart, and Grubhub; to Etsy, eBay, and Dick's Sporting Goods; and so many more, this book contains hundreds of real-company examples and 60 extensive cases that place coverage in the context of actual e-commerce businesses. You'll find these examples in each chapter as well as in special features such as chapter-opening, chapter-closing, and "Insight on" cases. The book takes a realistic look at the world of e-commerce, describing what's working and what isn't rather than presenting a rose-colored or purely "academic" viewpoint. We strive to maintain a critical perspective on e-commerce and avoid industry hyperbole.

Current and Future Technology Coverage Internet and related information technologies continue to change rapidly. The most important changes for e-commerce include dramatic price reductions in e-commerce infrastructure (making it much less expensive to develop a sophisticated e-commerce presence), the explosive growth in the mobile

platform, and expansion in the development of social technologies, which are the foundation of online social networks. Although we thoroughly discuss the current Internet environment, we also devote considerable attention to describing emerging technologies and applications such as the metaverse, Web3, the Internet of Things (IoT), blockchain, big data, artificial intelligence, augmented and virtual reality, low earth orbit satellite Internet systems, 5G and Wi-Fi 6, among many others.

Special Attention to the Social and Legal Aspects of E-commerce We have paid special attention throughout the book to the social and legal context of e-commerce. Chapter 8 is devoted to a thorough exploration of ethical dimensions of e-commerce, including information privacy, intellectual property, governance, and protecting safety and public welfare on the Internet.

In-depth Coverage of Marketing and Advertising The text includes two chapters on marketing and advertising, both traditional online marketing and social, mobile, and local marketing. Marketing concepts, including market segmentation, personalization, clickstream analysis, bundling of digital goods, long tail marketing, and dynamic pricing, are discussed throughout the text.

In-depth Coverage of B2B E-commerce We devote an entire chapter to an examination of B2B e-commerce. In writing this chapter, we developed a unique and easily understood classification schema to help students understand this complex arena of e-commerce. This chapter covers e-commerce supply chains, e-distributors, e-procurement companies, exchanges, and industry consortia, as well as the development of private B2B networks and collaborative commerce.

Up-to-Date Coverage of the Research Literature This text is well grounded in the e-commerce research literature. We have sought to include, where appropriate, references to and analysis of the latest e-commerce research findings, as well as many classic articles, in all of our chapters. We have drawn especially on the disciplines of economics, marketing, and information systems and technologies as well as on law journals and broader social science research journals that cover disciplines such as sociology and psychology. Figures and tables sourced to "authors' estimates" reflect analysis of data from the U.S. Department of Commerce, estimates from various research firms, historical trends, revenues of major online retailers, consumer online buying trends, and economic conditions.

Writing That's Fun to Read Unlike some textbooks, we've been told by many students that this book is actually fun to read and easy to understand. This is not a book written by committee—you won't find a dozen different people listed as authors, co-authors, and contributors on the title page. Instead, we have a consistent voice and perspective that carries through the entire text, and we believe the book is the better for it.

OVERVIEW OF THE BOOK

The book is organized into four parts.

Part 1, "Introduction to E-commerce," provides an introduction to the major themes of the book. Chapter 1 defines e-commerce, distinguishes between e-commerce and e-business, and defines the different types of e-commerce. Chapter 2 introduces and

defines the concepts of business model and revenue model, describes the major e-commerce business and revenue models for both B2C and B2B firms, and introduces the basic business concepts, including industry structure, value chains, and firm strategy, necessary for a thorough understanding of e-commerce firms. Chapter 2 also includes a section on the important topics of e-commerce technology and business model disruption.

Part 2, "Technology Infrastructure for E-commerce," focuses on the technology infrastructure that forms the foundation of all e-commerce. Chapter 3 traces the historical development of the Internet and thoroughly describes how the Internet, Web, and mobile platform work. Chapter 4 focuses on the steps that managers need to follow in order to build an e-commerce presence. This chapter also covers the process that should be followed in building an e-commerce presence; the major decisions regarding outsourcing site development and/or hosting; how to choose software, hardware, and other tools that can improve website performance; and issues involved in developing a mobile website and mobile applications. Chapter 5 focuses on e-commerce security and payments, building on the e-commerce infrastructure discussion of the previous chapter by describing the ways in which security can be provided over the Internet. This chapter defines digital information security, describes the major threats to security, and then discusses both the technology and the policy solutions available to business managers seeking to secure their firm's sites. This chapter concludes with a section on e-commerce payment systems. We identify the various types of online payment systems and discuss the development of alternative payment systems such as Apple Pay, Venmo, Zelle, Buy Now Pay Later (BNBP) services, as well as cryptocurrencies and blockchain, the technology underlying cryptocurrencies.

Part 3, "Business Concepts and Social Issues," focuses directly on the business concepts and social-legal issues that surround the development of e-commerce. Chapter 6 focuses on e-commerce consumer behavior and the Internet audience and introduces the student to the basics of online marketing and branding, including traditional online marketing technologies and marketing strategies. Topics include the website as a marketing platform, search engine marketing and advertising, display ad marketing, e-mail campaigns, affiliate and lead generation marketing programs, multichannel marketing, and various customer retention strategies such as personalization (including interest-based advertising, also known as behavioral targeting) and customer service tools. The chapter also covers other marketing strategies such as pricing and long tail marketing. Internet marketing technologies (web transaction logs, tracking files, data mining, and big data) and marketing automation and CRM systems are also explored. The chapter concludes with a section on understanding the costs and benefits of various types of online marketing, including a section on marketing analytics software. Chapter 7 is devoted to an in-depth analysis of social, mobile, and local marketing. Topics include Facebook, Instagram, TikTok, Twitter, Pinterest, and other social media marketing platforms such as Snapchat and LinkedIn; the evolution of mobile marketing; and the growing use of geo-aware technologies to support proximity marketing. Chapter 8 provides a thorough introduction to the social and legal environment of e-commerce. Here, you will find a description of the ethical and legal dimensions of e-commerce, including a thorough discussion of the latest developments in personal information privacy, intellectual property, Internet governance, questions surrounding Big Tech and competition, jurisdiction, and public health and welfare issues such as pornography, gambling, and health.

Part 4, "E-commerce in Action," focuses on real-world e-commerce experiences in online retail and services, online content and media, social networks, auctions, portals, and business-to-business e-commerce. These chapters take a sector approach rather than the conceptual approach used in the earlier chapters. E-commerce is different in each of these sectors. Chapter 9 takes a close look at the experience of firms in the retail marketplace for both goods and services, as well as on-demand service companies such as Uber and Airbnb. Chapter 9 also includes an "E-commerce in Action" case that provides a detailed analysis of the business strategies and financial operating results of Amazon, which can be used as a model to analyze other e-commerce firms. Chapter 10 explores the world of online content and digital media and examines the enormous changes in online publishing and entertainment industries that have occurred over the last two years, including online newspapers and magazines, e-books, streaming home entertainment, movies, music, and online games and e-sports. Chapter 11 explores the online world of social networks, auctions, and portals. Chapter 12 concentrates on the world of B2B e-commerce, describing e-commerce supply chains and various types of B2B business models, including different types of B2B e-commerce marketplaces as well as the less heralded but still very large arena of private B2B networks and the movement toward collaborative commerce.

CHAPTER ORGANIZATION

The book's pedagogy emphasizes student cognitive awareness and the ability to analyze, synthesize, and evaluate e-commerce businesses. Although there is a strong data and conceptual foundation to the book, we seek to engage student interest with lively writing about e-commerce businesses and the transformation of business models at traditional firms.

Each chapter contains a number of elements designed to make learning easy as well as interesting.

Learning Objectives A list of learning objectives that highlights the key concepts in the chapter guides student study.

Video Cases Each chapter has a list of video cases that are related to one or more key concepts or topics within the chapter.

Chapter-Opening Cases Each chapter opens with a case that features a leading e-commerce company or topic that relates the key objectives of the chapter to a real-life e-commerce business venture or issue. Companies featured include TikTok, Walmart, YouTube, Lemonade, LinkedIn, and Amazon Business, among others. Sources provide a list of the references that enable students to delve deeper into the topic of the case.

TikTok:

Creators and the Creator Economy

During its first decade or so, the Web was a very different place than it is today. It was much more static and used primarily to gather information. That all started to change around the mid-to-late 2000s, with the development of Web 2.0, a set of applications and technologies that enabled the creation of user-generated content. Coupled with the development of the smartphone and smartphone apps, this laid the groundwork for social networks and the sharing of all sorts of content that allowed people to express themselves online. People who develop and distribute such content are now typically referred to as "creators," a label originated by YouTube in 2011 for a growing class of users that were attracting large audiences to their channels. From there, the label spread. Influencers, who use social media to grow a following and exert influence over the purchasing decisions of those followers, typically for some form of compensation or monetization, can be considered a subset of creators, although some use the terms synonymously. A recent report estimates the number of creators at 200 million worldwide, and an entire supporting ecosystem, referred to as the creator economy, has spread up around them. TikTok is one of the preeminent content platforms in the creator economy.

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TikTok, the third-most-popular social network in the United States behind Facebook and Instagram, is also one of the fastest growing, with 95 million U.S. users and more than 750 million worldwide. (TikTok says it has more than 1 billion users.) Launched in 2017, TikTok is a short-form video-sharing app owned by Chinese company Bytedance. TikTok videos were initially limited to 15 seconds but can now be up to 10 minutes long. Many TikTok videos feature music, with users lip-syncing, singing, and dancing; others focus on comedy and creativity. Users can "remix" posts from other users and put their own spin on them, using the app's array of editing tools, filters, and other effects. Algorithms analyze the viewing habits of each user, and its "For You" page provides content that is customized based on the user's activity. The algorithm makes it possible for TikTokers to amass millions of followers within a matter of weeks, creating stars faster than any other platform.

TikTok skews much younger than other social networks and is the most popular network in the United States among children, teens, and young adults. Almost 70 percent of its U.S. users are under the age of 35. In 2022, TikTok is expected to become the leading social network platform among U.S. adult users (ages 18 and over) in terms of time spent per day (more than 45 minutes), surpassing YouTube. A survey of 7,000 TikTok users revealed that almost 70% follow specific creators. Gen Z is leading the charge, with 50% saying that they follow specific TikTok creators.

3

"Insight on" Cases Each chapter contains three real-world cases illustrating the themes of technology, business, or society. These cases take an in-depth look at relevant topics to help describe and analyze the full breadth of the field of e-commerce. The cases probe such issues as the ability of governments to regulate Internet content, how to design websites for accessibility, the challenges faced by luxury marketers in online marketing, and biometric security. Companies featured include Facebook, Y Combinator, Foursquare, Etsy, SpaceX, Zoom, Wix, Duolingo, Yoox Net-a-Porter, Sprout Social, Stitch Fix, Instacart, Grubhub, Vox, Twitch, Yahoo, AOL, and De Beers, among others. Sources provide a list of the references that enable students to delve deeper into the topic of the case.

Margin Glossary Throughout the text, key terms and their definitions appear in the text margin where they are first introduced.

Real-Company Examples Drawn from actual e-commerce ventures, hundreds of pertinent examples are used throughout the text to illustrate concepts.

Careers in E-commerce At the end of every chapter, we feature a section on careers in e-commerce that examines a job posting, based on a real-world job opening, by an e-commerce company for an entry-level position. Examples include job openings for an e-commerce retail category specialist, a user experience (UX) designer, a cybersecurity threat management team trainee, a digital marketing assistant, an e-commerce privacy research associate, a digital audience development associate, a social marketing specialist, and a junior supply chain analyst, among others. We provide a brief overview of the field and the company, some details about the position, a list of the qualifications and skills that are typically required, and some tips about how to prepare for an interview, and then show how the concepts learned in each chapter can help students answer some possible interview questions.

Chapter-Closing Case Studies Each chapter concludes with a robust case study based on real-world organizations. These cases help students synthesize chapter concepts and apply their knowledge to concrete problems and scenarios. Companies featured include Uber, Twitter, Akamai, Dick's Sporting Goods, Venmo, Zelle, Blue Nile, Netflix, eBay, and Elemica, among others. Sources provide a list of references that enable students to delve deeper into the topic of each case.

Chapter-Ending Pedagogy Each chapter contains extensive end-of-chapter materials designed to reinforce the learning objectives of the chapter:

2.6 CASE STUDY

Weathering the Storm:
Twitter's Uncertain Future

Twitter, the social network originally based on 140-character text messages, emerged seemingly out of nowhere to take the world by storm. Twitter's basic idea was to marry short text messaging on cellphones with the Web and its ability to create social groups. As the years passed, Twitter expanded beyond simple text messages to article previews, photographs, videos, and animated images, by 2022, it had almost 230 million daily active users worldwide. The 5,000 tweets per a day that it began with in 2006 has turned into a deluge of around 10,000 tweets per second and more than 500 million per day worldwide. Special events, such as the Super Bowl and Academy Awards, tend to generate an explosion of tweets. Some celebrities, such as pop star Justin Bieber, have millions of followers (in Bieber's case, around 114 million).

Twitter has a number of important assets, such as user attention, significant audience size (unique visitors), and its searchable database of tweets, which contain real-time audience comments, observations, and opinions. Twitter has become a significant media platform for the distribution of news. However, Twitter has also struggled to develop a profitable business model and display consistent growth, and its financial results and stock price have not matched its popularity and influence on culture and politics. Its user base remains a fraction of the size of Facebook's, TikTok's, and Instagram's.

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- **Key Concepts** Keyed to the learning objectives, Key Concepts present the key points of the chapter to aid student study.
- **Review Questions** Thought-provoking questions prompt students to demonstrate their comprehension and apply chapter concepts to management problem solving.
- **Projects** At the end of each chapter are a number of projects that encourage students to apply chapter concepts and to use higher-level evaluation skills. Many projects make use of the Internet and require students to present their findings in an oral presentation or a written report. For instance, students are asked to evaluate publicly available information about a company's financials at the SEC website, assess payment system options for companies that function across international boundaries, or search for the top 10 cookies on their own computer and the sites the cookies are from.
- **References** At the end of each chapter, a list of references enables students to find more information about the content and topics discussed in the chapter.

INSTRUCTOR RESOURCES

At Pearson.com, educators can easily register to gain access to a variety of instructor resources that are available with this text in downloadable format. If assistance is needed, our dedicated technical support team is ready to help with the media supplements that accompany this text. Visit support.pearson.com/getsupport for answers to frequently asked questions and toll-free user support phone numbers.

The following supplements are available with this text:

- **Instructor's Manual** written by the authors. Provides chapter-by-chapter teaching outlines, teaching suggestions and key points, and answers to all questions and projects included in the textbook.
- **Test Bank** created by the authors. Includes a variety of multiple-choice, true/false, and essay questions. Includes questions on chapter content but also includes questions that require higher-level cognitive skills, such as analysis, synthesis, evaluation, and written communication skills.
- **TestGen Computerized Test Bank** Allows instructors to customize, save, and generate classroom tests; edit, add, or delete questions from the Test Item Files; analyze test results; and organize a database of tests and student results.
- **PowerPoints** created by the authors. Summarize key concepts and figures in an easy-to-present format. PowerPoints meet accessibility standards for students with disabilities. Features include but are not limited to keyboard and screen reader access, alternative text for images, and a high-color contrast between background and foreground colors.
- **Image Library**
- **Video Cases** The authors have created a collection of video case studies that integrate a short video and associated case study, and case study questions. Video cases can be used in class to promote discussion or as written assignments. There are 24 video cases for the 17th edition, all new to this edition.

  Chapter 1
  Video Case 1.1: Shopify and the Future of E-commerce
  Video Case 1.2: YouTube and the Creator Economy

  Chapter 2
  Video Case 2.1: NFT Startup Magic Eden
  Video Case 2.2: Venture Capital Firm Neo

  Chapter 3
  Video Case 3.1: Meter's Internet Infrastructure Vision
  Video Case 3.2: Informatica and the Evolution of Cloud Technology

  Chapter 4
  Video Case 4.1: Bolt: One-Click Checkout for Small- and Medium-Sized Businesses
  Video Case 4.2: Figma: A Collaborative Web Application for UI Design

  Chapter 5
  Video Case 5.1: Crowdstrike and Cybersecurity
  Video Case 5.2: Klarna and Buy Now Pay Later (BNPL)

Chapter 6
Video Case 6.1: Google and the Digital Ad Market
Video Case 6.2: Mutiny Uses AI and No-Code to Improve AdTech

Chapter 7
Video Case 7.1: Snap and Augmented Reality Marketing
Video Case 7.2: AppLovin's Mobile Marketing Platform

Chapter 8
Video Case 8.1: Is TikTok a Surveillance Tool?
Video Case 8.2: NFT and Trademarks: Hermès Sues Over Birkin Bag NTFs

Chapter 9
Video Case 9.1: DoorDash Partners with BJ's Wholesale
Video Case 9.2: SoFi and Fintech

Chapter 10
Video Case 10.1: Substack: An Alternative News Delivery Platform
Video Case 10.2: Roblox and Online Gaming

Chapter 11
Video Case 11.1: Nextdoor and Local Social Networks
Video Case 11.2: Zigazoo: A Social Network for Kids

Chapter 12
Video Case 12.1: Apple and Supply Chain Disruption
Video Case 12.2: Ramp Helps Businesses with Procurement Processes

ABOUT THE AUTHORS

Kenneth C. Laudon has been a Professor of Information Systems at New York University's Stern School of Business. He holds a B.A. in Economics from Stanford and a Ph.D. from Columbia University. He has authored 12 books dealing with e-commerce, information systems, organizations, and society. Professor Laudon has also written more than 40 articles concerned with the social, organizational, and management impacts of information systems, privacy, ethics, and technology. At NYU's Stern School of Business, Professor Laudon has taught courses on Managing the Digital Firm, Information Technology and Corporate Strategy, Professional Responsibility (Ethics), and Electronic Commerce and Digital Markets.

Carol Guercio Traver is a graduate of Yale Law School and Vassar College. She has had many years of experience representing major corporations, as well as small- and medium-sized businesses, as an attorney with a leading international law firm with specific expertise in technology law, Internet law, privacy law, intellectual property law, and general corporate law. Carol is a co-author of *Essentials of MIS*, 15th Edition, as well as several other texts on information technology, and has been the lead project manager/editor on a number of technology-related projects. Carol is the co-founder and president of Azimuth Interactive, Inc., one of the first edtech firms and a provider of digital media and publisher services for the education industry.

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Barbara Ozog, Benedictine University
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Michelle Ramim, Nova Southeastern University
Jay Rhee, San Jose State University
Jorge Romero, Towson University
John Sagi, Anne Arundel Community College
Carl Saxby, University of Southern Indiana
Patricia Sendall, Merrimack College
Dr. Carlos Serrao, ISCTE/DCTI, Portugal
Neerja Sethi, Nanyang Business School, Singapore
Amber Settle, DePaul CTI
Vivek Shah, Texas State University—San Marcos
Wei Shi, Santa Clara University
Seung Jae Shin, Mississippi State University
Sumit Sircar, University of Texas at Arlington
Toni Somers, Wayne State University Mike Ilitch School of Business
Hongjun Song, University of Memphis
Pamela Specht, University of Nebraska at Omaha
Esther Swilley, Kansas State University
Tony Townsend, Iowa State University
Bill Troy, University of New Hampshire
Susan VandeVen, Southern Polytechnic State University
Hiep Van Dong, Madison Area Technical College
Michael Van Hilst, Nova Southeastern University
Mary Vitrano, Palm Beach Community College
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Irene Wheeler, CVCC
Rolf Wigand, University of Arkansas at Little Rock
Erin Wilkinson, Johnson & Wales University
Alice Wilson, Cedar Crest College
Dezhi Wu, Southern Utah University
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Kenneth C. Laudon
Carol Guercio Traver

PART 1

- **CHAPTER 1**
  The Revolution Is Just Beginning
- **CHAPTER 2**
  E-commerce Business Models and Concepts

Introduction to E-commerce

CHAPTER 1

The Revolution is Just Beginning

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

1.1 Understand why it is important to study e-commerce.
1.2 Define e-commerce, understand how e-commerce differs from e-business, identify the primary technological building blocks underlying e-commerce, and recognize major current themes in e-commerce.
1.3 Identify and describe the unique features of e-commerce technology and discuss their business significance.
1.4 Describe the major types of e-commerce.
1.5 Understand the evolution of e-commerce from its early years to today.
1.6 Describe the major themes underlying the study of e-commerce.

NEW Video Cases

See **eText Chapter 1** to watch these videos and complete activities:

1.1 Shopify and the Future of E-commerce

1.2 YouTube and the Creator Economy

TikTok:

Creators and the Creator Economy

©Daniel Constante/Shutterstock

During its first decade or so, the Web was a very different place than it is today. It was much more static and used primarily to gather information. That all started to change around the mid-to-late 2000s, with the development of Web 2.0, a set of applications and technologies that enabled the creation of user-generated content. Coupled with the development of the smartphone and smartphone apps, this laid the groundwork for social networks and the sharing of all sorts of content that allowed people to express themselves online. People who develop and distribute such content are now typically referred to as "creators," a label originated by YouTube in 2011 for a growing class of users that were attracting large audiences to their channels. From there, the label spread. Influencers, who use social media to grow a following and exert influence over the purchasing decisions of those followers, typically for some form of compensation or monetization, can be considered a subset of creators, although some use the terms synonymously. A recent report estimates the number of creators at 200 million worldwide, and an entire supporting ecosystem, referred to as the creator economy, has spread up around them. TikTok is one of the preeminent content platforms in the creator economy.

TikTok, the third-most-popular social network in the United States behind Facebook and Instagram, is also one of the fastest growing, with 95 million U.S. users and more than 750 million worldwide. (TikTok says it has more than 1 billion users.) Launched in 2017, TikTok is a short-form video-sharing app owned by Chinese company Bytedance. TikTok videos were initially limited to 15 seconds but can now be up to 10 minutes long. Many TikTok videos feature music, with users lip-syncing, singing, and dancing; others focus on comedy and creativity. Users can "remix" posts from other users and put their own spin on them, using the app's array of editing tools, filters, and other effects. Algorithms analyze the viewing habits of each user, and its "For You" page provides content that is customized based on the user's activity. The algorithm makes it possible for TikTokers to amass millions of followers within a matter of weeks, creating stars faster than any other platform.

TikTok skews much younger than other social networks and is the most popular network in the United States among children, teens, and young adults. Almost 70 percent of its U.S. users are under the age of 35. In 2022, TikTok is expected to become the leading social network platform among U.S. adult users (ages 18 and over) in terms of time spent per day (more than 45 minutes), surpassing YouTube. A survey of 7,000 TikTok users revealed that almost 70% follow specific creators. Gen Z is leading the charge, with 50% saying that they follow specific TikTok creators.

There are a number of ways that creators can earn money. They can be supported by advertising, for instance, receiving payment directly from a brand for creating or sharing sponsored content or for featuring a product placement, or they may be paid a share of the advertising revenue earned by the platform on which their content appears. They can also sell digital content, either on a per-piece basis or on a subscription basis, as well as physical products. Non-fungible tokens (NFTs), which can be used to create unique digital assets such as collectibles, artwork, badges, and stickers, are a newer form of digital content that creators are beginning to use as rewards for their fans. Creators can also get "tips" from their fans (often characterized as "buying the creator a coffee"), money from a fan club or a donation platform, or for other types of fan engagement. Most creators use a variety of these income-generating methods rather than relying on just one.

Of the estimated 200 million creators, a much smaller subset characterizes themselves as "professionals." For these people, being a creator has evolved into a business. The leading creators on TikTok can earn millions of dollars. For example, Charli D'Amelio, who is probably the most well-known, with around 145 million followers, earned $17.5 million in 2021 according to *Forbes*, putting her at the top of the list of professional creators. Trained as a competitive dancer, Charli started posting dance and lip-synch videos on TikTok in May 2019 when she was just 15, and she quickly amassed a large following. Her older sister, Dixie D'Amelio, a singer with 57 million followers, was second on the list, with $10 million in earnings. The two sisters have capitalized on their TikTok fame by branching out into a clothing line as well as a Hulu docuseries, among other initiatives. In the third spot is Addison Rae, also a competitive dancer, with around 88 million followers and about $8.5 million in earnings. As with the D'Amelio sisters, Rae has leveraged her TikTok fame, releasing a music single in 2021 as well as inking a deal with Netflix.

But not everything is rosy in the creator economy. Although superstar creators can make an incredible amount of money, it is extremely difficult for the average creator to earn enough to replace a full-time income, and most creators make only a very limited amount of income, if any. Almost half of full-time creators make less than $1,000, and only 12% make more than $50,000, underscoring how difficult it can be to be a creator. The majority of creators do not have any sponsorship or branding deals, and even among those who do, most make less than $100 per paid post.

Being a content creator is also much more time consuming and stressful than many might assume. Jack Innanen, a 22-year-old TikTok star from Toronto, Canada, has 2.8 million followers. Innanen spends hours shooting video, editing, storyboarding, engaging with fans, and trying to obtain brand deals. Chrissy Chlapecka, a 21-year-old former Starbucks barista, is another example. Chlapecka started posting videos on TikTok as a way to deal with boredom during the Covid-19 pandemic and has since amassed 4.8 million followers. She spends at least an hour a day selecting her clothing and having her hair and makeup professionally done, in preparation for filming at least one video per day. Chlapecka notes that most people underestimate the amount of work that creators have to do and that it takes skill and perseverance to come up with fresh ideas day after day, establish a relationship with online followers, and try to obtain sponsorships. The grind wears many content creators down, leading to potential mental and physical health problems. TikTok's algorithm adds to the stress, as it is constantly serving up new content, making it hard for

SOURCES: "What Is the 'Creator Economy,'" by Werner Geyser, Influencermarketinghub.com, June 10, 2022; "In a First, TikTok Will Beat YouTube in User Time Spent," by Sara Lebow, Insider Intelligence/eMarketer, May 26, 2022; "The State of the Creator Economy: Definition, Growth, & Market Size," by Werner Geyser, Influencermarketinghub.com, May 20, 2022; "TikTok Is Giving Top Creators a Cut of Ad Revenues," by Daniel Konstantinovic, Insider Intelligence/eMarketer, May 5, 2022; "2022 Creator Report," Linktr.ee, April 20, 2022; "200 Million People Are Earning Money from Content Creation," by Sam Gutelle, Tubefilter.com, April 20, 2022; "TikTok Faces a Wave of Creator Frustration and Content Moderation Issues," by Daniel Konstantinovic, Insider Intelligence/eMarketer, March 25, 2022; "With a Voice Like Ariana Grande and a Message of Self-Love, Chicago TikTok Sensation

creators to maintain their viewership. Creators note that this volatility can be rattling: As quickly as their views rise, they can also fall, with fans moving on to the next new thing. And there is also an even darker side to being a content creator. Creators report being the subject of bullying, harassment, and threats. Internet trolls, especially, can be brutally vicious.

TikTok has established a $200 million Creator Fund, which it says is aimed at supporting creators seeking to make their livelihood through innovative content. To be eligible for the Creator Fund, creators must be at least 18 years old, must have at least 10,000 followers, and must have accumulated at least 10,000 video views in the previous 30 days before they apply. Some creators feel that this shuts out beginning and niche creators, who need the most support. In addition, the amount paid to creators by the Fund has been less than many expected when it was first announced, with an opaque payment structure. Unlike YouTube, which gives creators a cut of the ad revenues generated on the platform, TikTok did not. However, in May 2022, TikTok announced that it would expand its creator monetization options via a new program called TikTok Pulse, which will run ads alongside the top 4% of all videos and give creators a 50% cut of those ad revenues. However, many feel that this does not go far enough and once again shuts out smaller and niche creators. These critics point out that TikTok's ad revenues, which are expected to top $11 billion in 2022 (surpassing the combined ad revenues of Twitter and Snapchat), have been growing rapidly and that it would be more equitable if TikTok shared that revenue more broadly with the people responsible for attracting users to the platform.

Aims to Be a Virtual Big Sister," by Ashley Capoot, *Chicago Tribune*, February 2, 2022; "TikTok, Instagram Influencers Criticize Creator Payment Programs," by Rachel Wolff, Insider Intelligence/eMarketer, January 29, 2022; "Making Money Online, the Hard Way," by Shira Ovide, *New York Times*, January 27, 2022; "Payday for TikTok's Biggest Stars," by Katharina Buchholz, Statista.com, January 11, 2022; "Top-Earning TikTok-ers 2022: Charli and Dixie D'Amelio and Addison Rae Expand Fame—and Paydays," by Abram Brown and Abigail Freeman, Forbes.com, January 7, 2022; "TikTok Shares New Insights into Usage Trends, and Its Impacts on Audience Behaviors," by Andrew Hutchinson, Socialmediatoday.com, August 30, 2021; "Young Creators Are Burning Out and Breaking Down," by Taylor Lorenz, *New York Times*, June 8, 2021; "TikTok Is Paying Creators. Not All of Them Are Happy," by Louise Matsakis, Wired.com, September 10, 2020.

In 1994, e-commerce as we now know it did not exist. In 2022, almost 215 million U.S. consumers are expected to spend about $1.3 trillion, and businesses about $8.5 trillion, purchasing products and services via a desktop/laptop computer, mobile device, or smart speaker. A similar story has occurred throughout the world. There have been significant changes in the e-commerce environment during this time period.

The early years of e-commerce, during the late 1990s, were a period of business vision, inspiration, and experimentation. It soon became apparent, however, that establishing a successful business model based on those visions would not be easy. There followed a period of retrenchment and reevaluation, which led to the stock market crash of 2000–2001, with the value of e-commerce, telecommunications, and other technology stocks plummeting. After the bubble burst, many people were quick to write off e-commerce. But they were wrong. The surviving firms refined and honed their business models, and the technology became more powerful and less expensive, ultimately leading to business firms that actually produced profits. Between 2002 and 2007, retail e-commerce grew at more than 25% per year.

Then, in 2007, Apple introduced the first iPhone, a transformative event that marked the beginning of yet another new era in e-commerce. Today, mobile devices, such as smartphones and tablet computers, and mobile apps have supplanted the traditional desktop/laptop platform and web browser as the most common method for consumers to access the Internet. Facilitated by technologies such as cellular networks, Wi-Fi, and cloud computing, mobile devices have become advertising, shopping, reading, and media-viewing machines, and in the process they have transformed consumer behavior yet again. During the same time period, social networks such as Facebook, Twitter, YouTube, Pinterest, Instagram, Snapchat, and TikTok, which enable users to distribute their own content (such as videos, music, photos, personal information, commentary, blogs, and more), rocketed to prominence. As discussed in the opening case, many such users, now referred to as creators and/or influencers, have taken additional steps to monetize their content. The mobile platform infrastructure also gave birth to another e-commerce innovation: on-demand services that are local and personal. From hailing a taxi to finding travel accommodations, to food delivery, on-demand services have created a marketspace that enables owners of resources such as cars, spare bedrooms, and spare time to find a market of eager consumers looking for such services. Today, mobile, social, and local are the driving forces in e-commerce. But e-commerce is always evolving. On the horizon are further changes, driven by technologies such as artificial intelligence, virtual and augmented reality, and blockchain, among others.

While the evolution of e-commerce technology and business has been a powerful and mostly positive force in our society, it is becoming increasingly apparent that it also has had, and continues to have, a serious societal impact, from promoting the invasion of personal privacy to aiding the dissemination of false information, enabling widespread security threats, and facilitating the growth of business titans, such as Amazon, Google, and Facebook (which has rebranded as Meta), that dominate their fields, leading to a decimation of effective competition. As a result, the Internet and e-commerce are entering a period of closer regulatory oversight that may have a significant impact on the conduct of e-commerce in the future.

1.1 THE FIRST FIVE MINUTES: WHY YOU SHOULD STUDY E-COMMERCE

The rapid growth and change that have occurred in the first quarter-century or so since e-commerce began in 1995 represents just the beginning—what could be called the first five minutes of the e-commerce revolution. Technology continues to evolve at exponential rates. This underlying evolution presents entrepreneurs with opportunities to create new business models and businesses in traditional industries and in the process disrupt—and in some instances destroy—existing business models and firms. The rapid growth of e-commerce is also providing extraordinary growth in career and employment opportunities, which we describe throughout the book.

Improvements in underlying information technologies and continuing entrepreneurial innovation in business and marketing promise as much change in the next decade as was seen in the previous two and a half decades. The twenty-first century will be an age of a digitally enabled social and commercial life, the outlines of which we can still only barely perceive at this time. It appears likely that e-commerce will eventually impact nearly all commerce and that most commerce will be e-commerce by the year 2050, if not sooner.

Business fortunes are made—and lost—in periods of extraordinary change such as this. The next five to 10 years hold exciting opportunities—as well as significant risks—for new and traditional businesses to exploit digital technology for market advantage, particularly in the wake of the Covid-19 pandemic, which continues to have a broad and lasting impact on many aspects of life, ranging from how businesses operate, to how consumers act, and to how social and cultural life evolves.

It is important to study e-commerce in order to be able to perceive and understand the opportunities and risks that lie ahead. By the time you finish this book, you will be able to identify the technological, business, and social forces that have shaped—and continue to shape—the growth of e-commerce and be ready to participate in, and ultimately guide, discussions of e-commerce in the firms where you work. More specifically, you will be able to analyze an existing or new idea for an e-commerce business, identify the most effective business model to use, and understand the technological underpinnings of an e-commerce presence, including the security and ethical issues raised as well as how to optimally market and advertise the business, using both traditional digital marketing tools and social, mobile, and local marketing.

1.2 INTRODUCTION TO E-COMMERCE

In this section, we'll first define e-commerce and then discuss the difference between e-commerce and e-business. We will also introduce you to the major technological building blocks underlying e-commerce: the Internet, the Web, and the mobile platform. The section concludes with a look at some major current trends in e-commerce.

WHAT IS E-COMMERCE?

e-commerce
the use of the Internet, the Web, and mobile apps and browsers running on mobile devices to transact business. More formally, digitally enabled commercial transactions between and among organizations and individuals

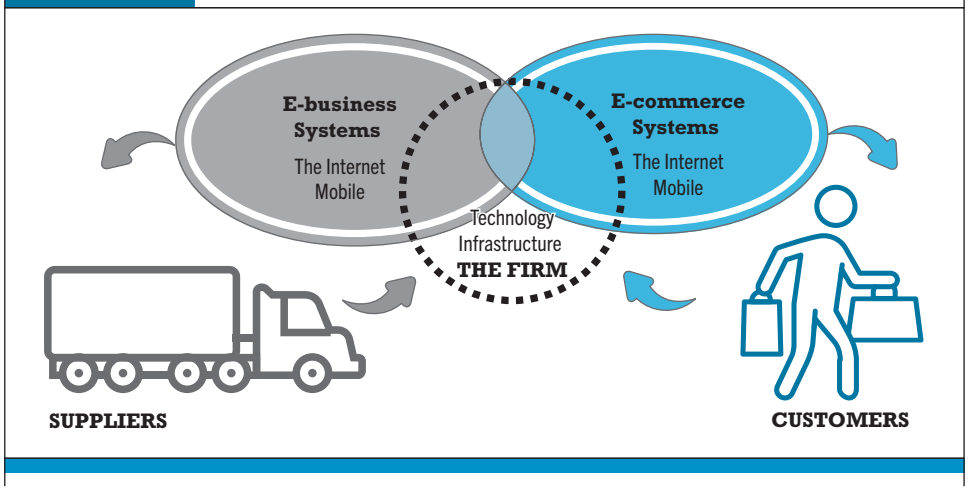
E-commerce involves the use of the Internet, the World Wide Web (Web), and mobile apps and browsers running on mobile devices to transact business. Although the terms Internet and Web are often used interchangeably, they are actually two very different things. The *Internet* is a worldwide network of computer networks, and the *Web* is one of the Internet's most popular services, providing access to trillions of web pages. An *app* (shorthand for "application") is a software application. The term is typically used when referring to mobile applications, although it is also sometimes used to refer to desktop computer applications as well. A *mobile browser* is a version of web browser software accessed via a mobile device. (We describe the Internet, Web, and mobile platform more fully later in this chapter and in Chapters 3 and 4.) More formally, e-commerce can be defined as digitally enabled commercial transactions between and among organizations and individuals. Each of these components of our working definition of e-commerce is important. *Digitally enabled transactions* include all transactions mediated by digital technology. For the most part, this means transactions that occur over the Internet, the Web, and/or via mobile devices. *Commercial transactions* involve the exchange of value (e.g., money) across organizational or individual boundaries in return for products and services. Exchange of value is important for understanding the limits of e-commerce. Without an exchange of value, no commerce occurs. The professional literature sometimes refers to e-commerce as digital commerce. For our purposes, we consider e-commerce and digital commerce to be synonymous.

THE DIFFERENCE BETWEEN E-COMMERCE AND E-BUSINESS

There is a debate about the meaning and limitations of both *e-commerce* and *e-business*. Some argue that e-commerce encompasses the entire world of digitally based organizational activities that support a firm's market exchanges—including a firm's entire information system infrastructure. Others argue, on the other hand, that e-business encompasses the entire world of internal and external digitally based activities, including e-commerce. We think it is important to make a working distinction between *e-commerce* and *e-business* because we believe they refer to different phenomena. E-commerce is not "anything digital" that a firm does. For purposes of this text, we will use the term **e-business** to refer primarily to the digital enabling of transactions and processes *within* a firm, involving information systems under the control of the firm. For the most part, in our view, e-business does not include commercial transactions involving an exchange of value across organizational boundaries. For example, a company's online inventory control mechanisms are a component of e-business, but such internal processes do not directly generate revenue for the firm from outside businesses or consumers, whereas e-commerce, by definition, does. It is true, however, that a firm's e-business infrastructure provides support for online e-commerce exchanges: The same infrastructure and skill sets are involved in both e-business and e-commerce. E-commerce and e-business systems blur together at the business firm boundary, at the point where internal business systems link up with suppliers or customers (see **Figure 1.1**). E-business applications turn into e-commerce precisely when an exchange of value occurs. We will examine this intersection further in Chapter 12.

e-business
the digital enabling of transactions and processes within a firm, involving information systems under the control of the firm

FIGURE 1.1 THE DIFFERENCE BETWEEN E-COMMERCE AND E-BUSINESS



E-commerce primarily involves transactions that cross firm boundaries. E-business primarily involves the application of digital technologies to business processes within the firm.

TECHNOLOGICAL BUILDING BLOCKS UNDERLYING E-COMMERCE: THE INTERNET, THE WEB, AND THE MOBILE PLATFORM

The technology juggernauts behind e-commerce are the Internet, the Web, and the mobile platform. We describe the Internet, the Web, and the mobile platform in some detail in Chapter 3. The **Internet** is a worldwide network of computer networks built on common standards. Created in the late 1960s to connect a small number of mainframe computers and their users, the Internet has since grown into the world's largest network. It is impossible to say with certainty exactly how many computers and other mobile devices (such as smartphones and tablets) as well as other Internet-connected consumer devices (such as smartwatches, connected TVs, and smart speakers like Amazon's Echo) are connected to the Internet worldwide at any one time. However, some experts estimate that as of 2022, there are about 15 billion connected devices (not including smartphones, tablets, or desktop/laptop computers) already installed (Watters, 2022). The Internet links businesses, educational institutions, government agencies, and individuals together and provides users with services such as e-mail, document transfer, shopping, research, instant messaging, music, videos, and news.

Internet
worldwide network of computer networks built on common standards

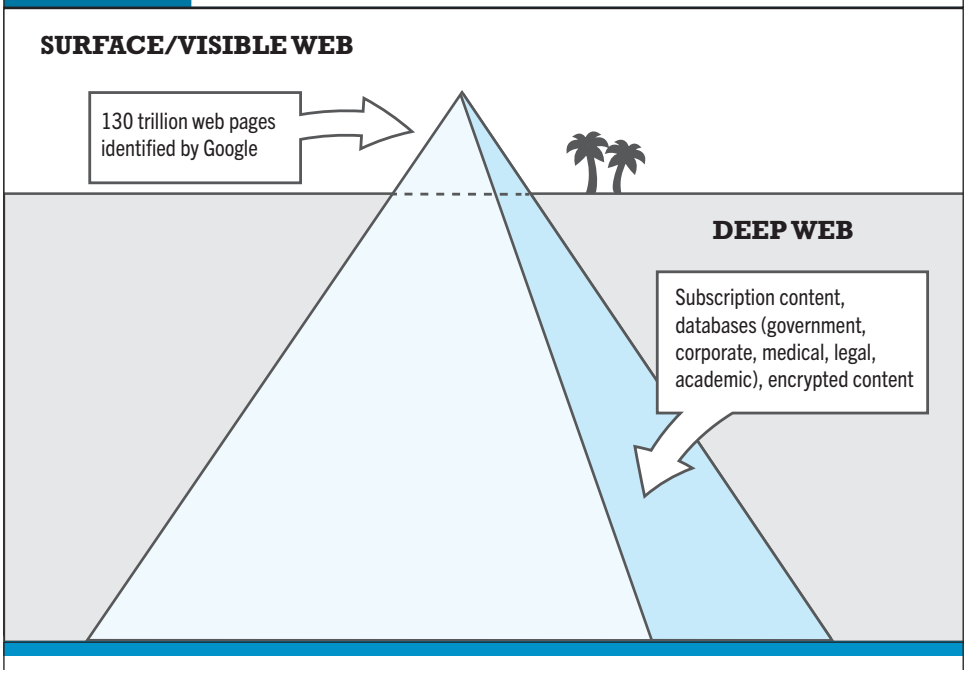
The Internet has shown extraordinary growth patterns when compared to other electronic technologies of the past. It took radio 38 years to achieve a 30% share of U.S. households. It took television 17 years to achieve a 30% share. In contrast, it took only 10 years for the Internet/Web to achieve a 53% share of U.S. households once a graphical user interface was invented for the Web in 1993. Today, in the United States, more than 300 million people of all ages (almost 90% of the U.S. population) use the Internet at least once a month (Insider Intelligence/eMarketer, 2022a).

World Wide Web (the Web)
an information system running on the Internet infrastructure and that provides access to trillions of web pages

The **World Wide Web (the Web)** is an information system that runs on the Internet infrastructure. The Web was the original "killer app" that made the Internet commercially interesting and extraordinarily popular. The Web was developed in the early 1990s and hence is of much more recent vintage than the Internet. We describe the Web in some detail in Chapter 3. The Web provides access to trillions of web pages indexed by Google and other search engines. These pages are created in a language called *HTML* (*HyperText Markup Language*). HTML pages can contain text, graphics, animations, and other objects. Prior to the Web, the Internet was primarily used for text communications, file transfers, and remote computing. The Web introduced far more powerful capabilities of direct relevance to commerce. In essence, the Web added color, voice, and video to the Internet, creating a communications infrastructure and information storage system that rivals television, radio, magazines, and libraries.

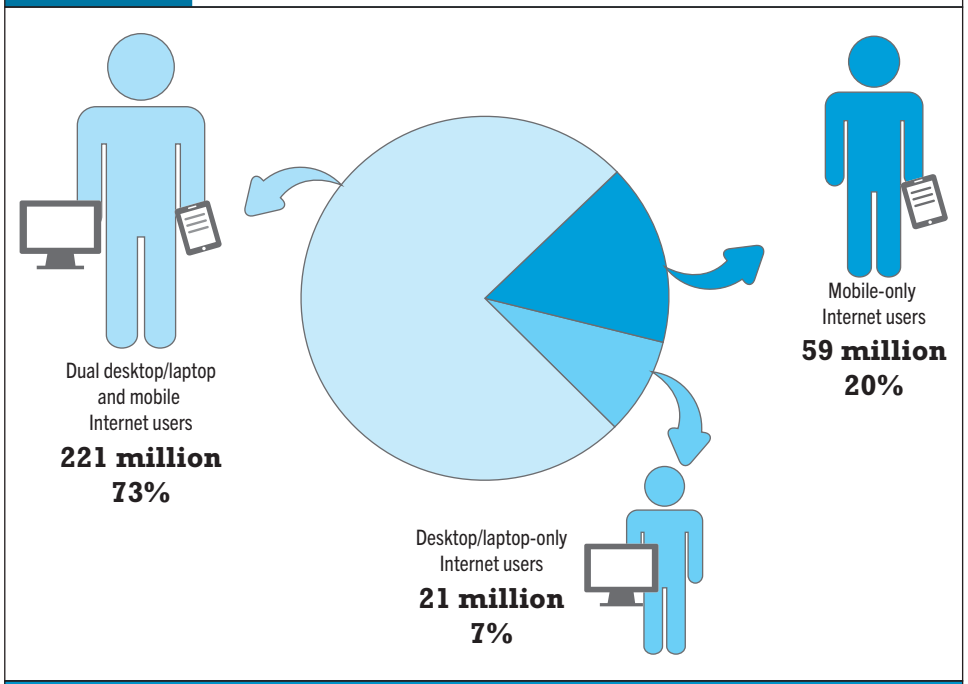
There is no precise measurement of the number of web pages in existence, in part because today's search engines index only a portion of the known universe of web pages. By 2013, Google had indexed 30 trillion individual web pages, and by 2016, the last year that Google released data on the size of its index, that number had jumped to more than 130 trillion, although many of these pages did not necessarily contain unique content. Since then, it is likely that the number has continued to skyrocket (Wodinsky, 2021). In addition to this "surface" or "visible" Web, there is the so-called deep Web, which is reportedly 500 to 1,000 times greater than the surface Web. The deep Web contains databases and other content that is not routinely identified by search engines such as Google (see **Figure 1.2**). Although the total size of the Web is not known, what is indisputable is that web content has grown exponentially over the years.

FIGURE 1.2 THE DEEP WEB



The surface Web is only a small part of online content.

FIGURE 1.3 INTERNET ACCESS IN THE UNITED STATES, 2022



More than 73% of Internet users in the United States (about 220 million people) use both desktop/laptop computers and mobile devices to access the Internet. About 20% (about 60 million people) go online only by using a mobile device. Just 7% (about 20 million people) use only a desktop or laptop computer to access the Internet.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022a, 2022c, 2022d.

The mobile platform has become a significant part of Internet infrastructure. The **mobile platform** provides the ability to access the Internet from a variety of mobile devices such as smartphones, tablets, and ultra-lightweight laptop computers such as Google's Chromebook via wireless networks or cellphone service. **Figure 1.3** illustrates the variety of devices that people in the United States use to access the Internet. Mobile devices play an increasingly prominent role in Internet access. In 2022, about 93% of U.S. Internet users use a mobile device to access the Internet at least some of the time (Insider Intelligence/eMarketer, 2022b).

mobile platform provides the ability to access the Internet from a variety of mobile devices such as smartphones, tablets, and ultra-lightweight laptop computers

The mobile platform is not just a hardware phenomenon. The introduction of the Apple iPhone in 2007, followed by the Apple iPad in 2010, has also ushered in a sea-change in the way people interact with the Internet from a software perspective. In the early years of e-commerce, the Web and web browsers were the only game in town. Today, in contrast, more people in the United States access the Internet via a mobile app on a mobile device than by using a desktop/laptop computer and web browser. *Insight on Technology: Will Apps Make the Web Irrelevant?* examines in more depth the challenge that apps and the mobile platform pose to the Web's dominance of the Internet ecosphere.

INSIGHT ON TECHNOLOGY

WILL APPS MAKE THE WEB IRRELEVANT?

Nowadays, it's hard to recall a time before the Web. How did we get along without the ability to go online to search for an item, learn about a topic, play a game, or watch a video? Although the Web has come a remarkably long way from its humble beginnings, some experts think that the Web's best days are behind it. Opinions vary about the future role of the Web in a world where apps have become a dominant force in the Internet ecosystem. In 10 years, will the Web be a forgotten relic? Or will the Web and apps coexist peacefully as vital cogs in the Internet ecosystem? Will the app craze eventually die down as users gravitate back toward the Web as the primary way to perform online tasks?

Apps have grown into a disruptive force ever since Apple launched its App Store in 2008. The list of industries that apps have disrupted is wide-ranging: communications, media and entertainment, logistics, education, health care, dating, travel, and financial services. Despite not even existing prior to 2008, in 2021, sales of apps accounted for more than $170 billion in revenues worldwide, and the app economy is continuing to show robust growth.

Although the usage of apps tends to be highly concentrated, consumers are trying new apps all the time and typically use more than 45 different apps per month, leaving room for new app developers to innovate and create successful apps. Users are downloading an increasing number of apps, with the number of downloads reaching 230 billion worldwide in 2021, according to research firm Data.ai.

In 2014, for the first time ever, people in the United States used mobile devices more than desktop computers to access the Internet. The time U.S. adults are spending using mobile devices has exploded and now accounts for four and a half hours a day. Of the time spent using mobile devices, people spend almost four times the amount of time using apps (three hours and 22 minutes) compared to the time spent using mobile browsers (about 52 minutes).

Consumers have gravitated to apps for several reasons. First, smartphones and tablet computers enable users to use apps anywhere, instead of being tethered to a desktop or having to lug a heavy laptop around. Of course, smartphones and tablets enable users to use the Web too, but apps are often more convenient and boast more streamlined, elegant interfaces than mobile web browsers.

Apps are not only more appealing to consumers in certain ways but are also much more appealing to content creators and media companies. Apps are easier to control and monetize than websites, not to mention they can't be crawled by Google or other services. On the Web, the average price of ads per thousand impressions has fallen, and many content providers are still mostly struggling to turn the Internet into a profitable content delivery platform. Much of software and media companies' focus has shifted to developing mobile apps for this reason.

In the future, some analysts believe that the Internet will be used to transport data but that individual app interfaces will replace the web browser as the most common way to access and display content. Even the creator of the Web, Tim Berners-Lee, feels that the Web as we know it is being threatened.

But there is no predictive consensus about the role of the Web in our lives in the

next decade and beyond. Although apps may be more convenient than the Web in many respects, the depth of the web browsing experience trumps that of apps. The Web is a vibrant, diverse array of sites, and browsers have an openness and flexibility that apps lack. The connections among websites enhance their usefulness and value to users, and apps that instead seek to lock in users cannot offer the same experience. In addition, the size of the mobile web audience still exceeds that of the mobile app audience. And when it comes to making purchases online, using a web browser on a desktop computer still handily beats using mobile devices. Retail purchases made on desktops/laptops still account for almost 60% of all online retail purchases.

Analysts who are more optimistic about the Web's chances to remain relevant in an increasingly app-driven Internet ecosystem feel this way because of the emergence of HTML5 and progressive web apps (PWAs). HTML5 is a markup language that enables more dynamic web content and allows for browser-accessible web apps that are as appealing as device-specific apps. A PWA, which combines the best elements of mobile websites and native mobile apps, functions and feels like a native app but does not need to be downloaded from an app store and thus does not take up any of the mobile device's memory. Instead, it runs directly in a mobile web browser and is able to load instantly, even in areas of low connectivity. Some people think that a good PWA can ultimately function as a total replacement for a company's mobile website, its native app, and even possibly its desktop website.

The shift toward apps and away from the Web is likely to have a significant impact on the fortunes of e-commerce firms. As the pioneer of apps and the market leader in apps, smartphones, and tablet computers, Apple stands to gain from a shift toward apps, and although it also faces increasing competition from other companies, including Google, the established success of the App Store will make it next to impossible to dethrone Apple. For instance, while the number of downloads from Google's Google Play store was almost four times as many as the number of downloads from Apple's App Store in 2021, the App Store still made nearly twice the amount of revenue ($85 billion) than Google Play did ($48 billion). Google hopes that PWAs are at least a partial answer to the problem presented by native apps, because the more activity that occurs on native apps, which Google cannot crawl, the less data Google has access to, which impacts its web-based advertising platform.

Ultimately, most marketers see the future as one in which the Web and mobile apps work together, with each having an important role in serving different needs.

SOURCES: "US Time Spent with Connected Devices: A Return to Pre-Pandemic Growth," by Jessica Lins, Insider Intelligence/eMarketer, June 9, 2022; "US Desktop/Laptop Retail Ecommerce Sales," by Insider Intelligence/eMarketer, June 2022; "Average Number of Apps Used per Month, US Mobile Devices, 2019–2021," by Insider Intelligence/eMarketer, January 27, 2022; "The State of Mobile 2022," Data.ai.com, January 2022; "Global Consumer Spending in Mobile Apps Reached $133 Billion in 2021, Up Nearly 20% from 2020," Sensortower.com, December 2021;"Why Progressive Web Apps Are the Future of the Mobile Web: 2020 Research," by Jason Rzutkiewicz and Jeremy Lockhorn, Ymedialabs.com, September 19, 2020; "Publishers Straddle the Apple-Google, App-Web Divide," by Katie Benner and Conor Dougherty, *New York Times*, October 18, 2015; "How Apps Won the Mobile Web," by Thomas Claburn, Informationweek.com, April 3, 2014; "Mobile Apps Overtake PC Internet Usage in U.S.," by James O'Toole, Money.cnn.com, February 28, 2014; "Is The Web Dead in the Face of Native Apps? Not Likely, but Some Think So," by Gabe Knuth, Brianmadden.com, March 28, 2012; "The Web Is Dead? A Debate," by Chris Anderson, Wired.com, August 17, 2010; "The Web Is Dead. Long Live the Internet," by Chris Anderson and Michael Wolff, Wired.com, August 17, 2010.

MAJOR TRENDS IN E-COMMERCE

Table 1.1 describes the major trends in e-commerce in 2022–2023 from a business, technological, and societal perspective, the three major organizing themes that we use in this book to understand e-commerce (see Section 1.6).

From a business perspective, one of the most important trends to note is that all forms of e-commerce continue to show very strong growth. Retail e-commerce grew by more than 35% in 2020, in part as a result the Covid-19 pandemic, and in 2022 is expected to top the $1 trillion mark for the first time. By 2026, it is estimated that retail e-commerce will account for almost $1.7 trillion in revenue. Retail m-commerce also grew astronomically (by more than 44%) in 2020 and is anticipated to increase to more than $415 billion in 2022, constituting about 40% of all retail e-commerce sales. By 2026, retail m-commerce is expected to account for almost $700 billion. Social networks such as Facebook, Instagram, TikTok, Twitter, and Pinterest are enabling social e-commerce by providing advertising, searches, and the ability to purchase products without leaving the site. Local e-commerce is being fueled by the explosion of interest in on-demand services. B2B e-commerce, which dwarfs all other forms, also is continuing to strengthen and grow. The Covid-19 pandemic has resulted in an increased—and what is expected to be a lasting—shift to e-commerce.

From a technology perspective, the mobile platform based on smartphones and tablet computers has finally arrived with a bang, driving astronomical growth in mobile advertising and making true mobile e-commerce a reality. The use of mobile messaging services such as Facebook Messenger, WhatsApp, and Snapchat has created an alternative communications platform that is beginning to be leveraged for commerce as well. Cloud computing is inextricably linked to the development of the mobile platform because it enables the storage of consumer content and software on cloud (Internet-based) servers and makes the content and software available to mobile devices as well as to desktops. Other major technological trends include the increasing ability of companies to track and analyze the flood of online data (typically referred to as big data) being produced. The Internet of Things (IoT), comprised of billions of Internet-connected devices, continues to grow exponentially and is driving the growth of a plethora of smart devices as well as adding to the torrent of data. Other major technological trends include increasing use of artificial intelligence technologies, increasing interest in blockchain technologies, and increasing focus on the concept of a metaverse that will create an immersive, 3D Internet experience using augmented and virtual reality technologies.

At the societal level, other trends are apparent. The Internet and mobile platform provide an environment that allows millions of people to create and share content, establish new social bonds, and strengthen existing bonds through social networks and other types of online platforms. At the same time, privacy seems to have lost some of its meaning in an age when millions create public online personal profiles, leading to increased concerns over commercial and governmental privacy invasion. The major digital copyright owners have increased their pursuit of online piracy with mixed success while reaching agreements with the big technology players such as Apple, Amazon, and Google to protect intellectual property rights. Sovereign nations have expanded their surveillance of, and control over, online communications and content as a part of their anti-terrorist activities and their traditional interest in law enforcement. Online security, or the lack thereof, remains a significant issue, as new stories about security breaches, malware, hacking, and other attacks emerge seemingly daily.

TABLE 1.1 MAJOR TRENDS IN E-COMMERCE, 2022–2023

BUSINESS

- Retail e-commerce and m-commerce both settle back to "normal" growth rates (around 10%) after surging in 2020–2021 because of the Covid-19 pandemic.
- The mobile app ecosystem continues to grow, with almost 250 million U.S. adults using smartphone apps and more than 145 million using tablet computer apps in 2022.
- Social e-commerce, based on social networks and supported by advertising, continues to grow and is estimated to generate about $55 billion in 2022.
- Local e-commerce, the third dimension of the mobile, social, local e-commerce wave, also is growing in the United States, fueled by an explosion of interest in on-demand services such as Uber, Instacart, DoorDash, and others.
- B2B e-commerce revenues in the United States are expected to reach about $8.5 trillion.
- Mobile advertising continues to grow, accounting for more than two-thirds of all digital ad spending but may be impacted by new privacy-related app store rules that restrict the ability of advertisers to track users.
- The media business becomes more and more decentralized, with content created and distributed online by users (now typically referred to as creators) becoming more and more prevalent, giving rise to what is often termed the creator economy.

TECHNOLOGY

- A mobile platform based on smartphones, tablet computers, wearable devices, and mobile apps has become a reality, creating an alternative platform for online transactions, marketing, advertising, and media viewing.
- Cloud computing completes the transformation of the mobile platform by storing consumer content and software on "cloud" (Internet-based) servers and making it available to any consumer-connected device, from the desktop to a smartphone.
- The Internet of Things (IoT), comprised of billions of Internet-connected devices, continues to grow exponentially and drives the growth of a plethora of "smart/connected" devices such as TVs, watches, speakers, home-control systems, cars, etc.
- The trillions of online interactions that occur each day create a flood of data, typically referred to as big data. To make sense out of big data, firms turn to sophisticated software called business analytics (or web analytics) that can identify purchase patterns as well as consumer interests and intentions in milliseconds.
- Artificial intelligence technologies are being increasingly employed in a variety of e-commerce-related applications, such as for analyzing big data, customization and personalization, customer service, chatbots and voice assistants, and supply chain efficiency.
- Blockchain, the technology that underlies cryptocurrencies, non-fungible tokens (NFTs), and the concept of a more decentralized Internet known as Web3, attracts increasing interest, particularly from traditional financial service firms as well as firms seeking to use the technology for supply chain applications.
- Facebook rebrands as Meta, jumpstarting an increased focus on the "metaverse," which entails moving the Internet experience beyond 2D screens toward immersive, 3D experiences using augmented and virtual reality technologies.

SOCIETY

- User-generated content (UGC), published by creators online in the form of video, podcasts, newsletters, literary content, online classes, digital art, and more, continues to grow and provides a method of self-publishing that engages millions: both those who create the content and those who consume it.
- Concerns over commercial and governmental invasion of privacy increase.
- Concerns increase about the growing market dominance of Amazon, Google, and Meta (often referred to as Big Tech), leading to litigation and calls for government regulation.
- Conflicts over copyright management and control continue, although there is now substantial agreement among online distributors and copyright owners that they need one another.
- Surveillance of online communications by both repressive regimes and Western democracies grows.
- Online security continues to decline as major companies are hacked and lose control of customer information.
- On-demand services and e-commerce produce a flood of temporary, poorly paid jobs without benefits.

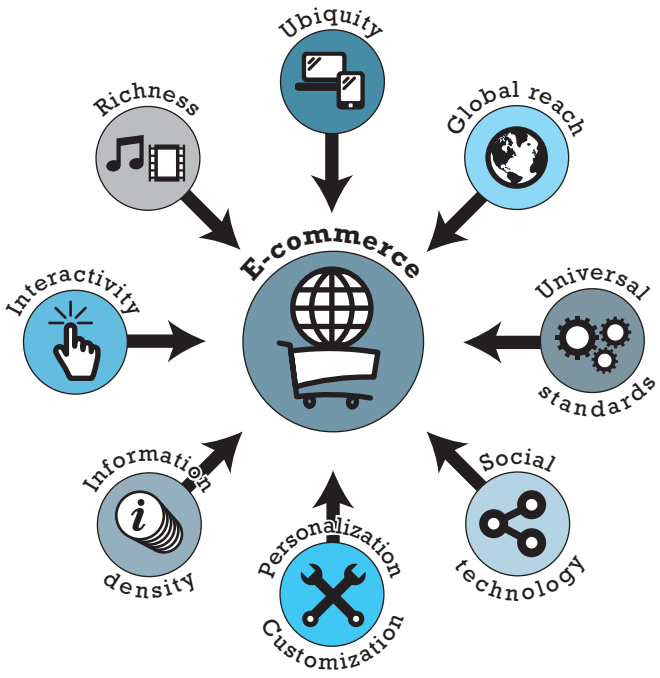
1.3 UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY

Figure 1.4 illustrates eight unique features of e-commerce technology that both challenge traditional business thinking and help explain why we have so much interest in e-commerce. These unique dimensions of e-commerce technologies suggest many new possibilities for marketing and selling—a powerful set of interactive, personalized, and rich messages is available for delivery to segmented, targeted audiences.

Prior to the development of e-commerce, the marketing and sale of goods was a mass-marketing and salesforce–driven process. Marketers viewed consumers as passive targets of advertising campaigns and branding "blitzes" intended to influence their long-term product perceptions and immediate purchasing behavior. Companies sold their products via well-insulated channels. Consumers were trapped by geographical and social boundaries, unable to search widely for the best price and quality. Information about prices, costs, and fees could be hidden from the consumer, creating profitable information asymmetries for the selling firm. **Information asymmetry** refers to any disparity in relevant market information among parties in a transaction. It was so expensive to change national or regional prices in traditional retailing (what are called *menu costs*) that one national price was the norm, and dynamic pricing to the marketplace (changing prices in real time) was unheard of. In this environment,

information asymmetry
any disparity in relevant market information among parties in a transaction

FIGURE 1.4 EIGHT UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY



E-commerce technologies provide a number of unique features that have impacted the conduct of business.

manufacturers prospered by relying on huge production runs of products that could not be customized or personalized.

E-commerce technologies make it possible for merchants to know much more about consumers and to be able to use this information more effectively than was ever true in the past. Online merchants can use this information to develop new information asymmetries, enhance their ability to brand products, charge premium prices for high-quality service, and segment the market into an endless number of subgroups, each receiving a different price. To complicate matters further, these same technologies also make it possible for merchants to know more about other merchants than was ever true in the past. This presents the possibility that merchants might collude rather than compete on prices and thus drive overall average prices up. This strategy works especially well when there are just a few suppliers (Varian, 2000a). We examine these different visions of e-commerce further in Section 1.4 and throughout the book.

Each of the dimensions of e-commerce technology illustrated in Figure 1.4 deserves a brief exploration as well as a comparison to both traditional commerce and other forms of technology-enabled commerce.

UBIQUITY

In traditional commerce, a **marketplace** is a physical place you visit in order to transact. For example, television and radio typically motivate the consumer to go someplace to make a purchase. E-commerce, in contrast, is characterized by its **ubiquity**: It is available just about everywhere and at all times. It liberates the market from being restricted to a physical space and makes it possible to shop from your desktop, at home, at work, or even from your car. The result is called a **marketspace**—a marketplace extended beyond traditional boundaries and removed from a temporal and geographic location.

marketplace
physical space you visit in order to transact

ubiquity
available just about everywhere and at all times

marketspace
marketplace extended beyond traditional boundaries and removed from a temporal and geographic location

From a consumer point of view, ubiquity reduces *transaction costs*—the costs of participating in a market. To transact, it is no longer necessary to spend time and money traveling to a market. At a broader level, the ubiquity of e-commerce lowers the cognitive energy required to transact in a marketspace. *Cognitive energy* refers to the mental effort required to complete a task. Humans generally seek to reduce cognitive energy outlays. When given a choice, humans will choose the path requiring the least effort—the most convenient path (Shapiro and Varian, 1999; Tversky and Kahneman, 1981).

GLOBAL REACH

E-commerce technology permits commercial transactions to cross cultural, regional, and national boundaries far more conveniently and cost-effectively than is true in traditional commerce. As a result, the potential market size for e-commerce merchants is roughly equal to the size of the world's online population (more than 4.5 billion in 2022) (Insider Intelligence/eMarketer, 2022e). More realistically, the Internet makes it much easier for startup e-commerce merchants within a single country to achieve a national audience than was ever possible in the past. The total number of users or customers that an e-commerce business can obtain is a measure of its **reach** (Evans and Wurster, 1997).

reach
the total number of users or customers that an e-commerce business can obtain

In contrast, most traditional commerce is local or regional—it involves local merchants or national merchants with local outlets. Television, radio stations, and newspapers, for instance, are primarily local and regional institutions with limited but powerful

national networks that can attract a national audience. In contrast to e-commerce technology, these older commerce technologies do not easily cross national boundaries to a global audience.

UNIVERSAL STANDARDS

universal standards
standards that are shared by all nations around the world

One strikingly unusual feature of e-commerce technologies is that the technical standards of the Internet, and therefore the technical standards for conducting e-commerce, are **universal standards**—they are shared by all nations around the world. In contrast, most traditional commerce technologies differ from one nation to the next. For instance, television and radio standards differ around the world, as does cellphone technology.

The universal technical standards of e-commerce greatly lower *market entry costs*—the cost merchants must pay just to bring their goods to market. At the same time, for consumers, universal standards reduce *search costs*—the effort required to find suitable products. And by creating a single, one-world marketspace, where prices and product descriptions can be inexpensively displayed for all to see, *price discovery* becomes simpler, faster, and more accurate (Banerjee et al., 2016; Bakos, 1997; Kambil, 1997). Users, both businesses and individuals, also experience *network externalities*—benefits that arise because everyone uses the same technology. With e-commerce technologies, it is possible for the first time in history to easily find many of the suppliers, prices, and delivery terms of a specific product anywhere in the world and to view them in a coherent, comparative environment. Although this is not necessarily realistic today for all or even most products, it is a potential that will be exploited in the future.

RICHNESS

richness
the complexity and content of a message

Information **richness** refers to the complexity and content of a message (Evans and Wurster, 1999). Traditional markets, national sales forces, and retail stores have great richness: They are able to provide personal, face-to-face service using aural and visual cues when making a sale. The richness of traditional markets makes them a powerful selling or commercial environment. Prior to the development of the Web, however, there was a trade-off between richness and reach: the larger the audience reached, the less rich the message.

E-commerce technologies have the potential for offering considerably more information richness than traditional media such as printing presses, radio, and television can because the former are interactive and can adjust the message to individual users. Chatting online with a customer service representative, for instance, can come close to the customer experience that takes place in a small retail shop. The richness enabled by e-commerce technologies allows retail and service merchants to market and sell "complex" goods and services that heretofore required a face-to-face presentation by a sales force to a much larger audience.

INTERACTIVITY

interactivity
technology that allows for two-way communication between merchant and consumer and among consumers

Unlike any of the commercial technologies of the twentieth century, with the possible exception of the telephone, e-commerce technologies allow for **interactivity**, meaning they enable two-way communication between merchant and consumer and among consumers. Traditional television or radio, for instance, cannot enter into conversations with viewers or listeners, ask them questions, or request customers to enter information into a form.

Interactivity allows an online merchant to engage a consumer in ways similar to a face-to-face experience. Comment features, community forums, and social networks with social sharing functionality such as Like and Share buttons all enable consumers to actively interact with merchants and other users. Somewhat less obvious forms of interactivity include responsive design elements such as websites that change format depending on what kind of device they are being viewed on, product images that change as a mouse hovers over them, the ability to zoom in or rotate images, forms that notify the user of a problem as they are being filled out, and search boxes that autofill as the user types.

INFORMATION DENSITY

E-commerce technologies vastly increase **information density**—the total amount and quality of information available to all market participants, consumers and merchants alike. E-commerce technologies reduce information collection, storage, processing, and communication costs. At the same time, these technologies greatly increase the currency, accuracy, and timeliness of information—making information more useful and important than ever. As a result, information becomes more plentiful, less expensive, and of higher quality.

information density the total amount and quality of information available to all market participants

A number of business consequences result from the growth in information density. One of the shifts that e-commerce is bringing about is a reduction in information asymmetry among market participants (consumers and merchants). Prices and costs become more transparent. *Price transparency* refers to the ease with which consumers can find out the variety of prices in a market; *cost transparency* refers to the ability of consumers to discover the actual costs merchants pay for products. Preventing consumers from learning about prices and costs becomes more difficult with e-commerce, and, as a result, the entire marketplace potentially becomes more price competitive (Sinha, 2000). But there are advantages for merchants as well. Online merchants can discover much more about consumers, which allows merchants to segment the market into groups willing to pay different prices and permits merchants to engage in *price discrimination*—selling the same goods, or nearly the same goods, to different targeted groups at different prices. For instance, an online merchant can discover a consumer's avid interest in expensive exotic vacations and then pitch expensive exotic vacation plans to that consumer at a premium price, knowing this consumer is willing to pay extra for such a vacation. At the same time, the online merchant can pitch the same vacation plan at a lower price to more price-sensitive consumers. Merchants also have enhanced abilities to differentiate their products in terms of cost, brand, and quality.

PERSONALIZATION AND CUSTOMIZATION

E-commerce technologies permit **personalization**: Merchants can target their marketing messages to specific individuals by adjusting the message to a person's name, interests, and past purchases. Today this is achieved in a few milliseconds and followed by an advertisement based on the consumer's profile. The technology also permits **customization**—changing the delivered product or service based on a user's preferences or prior behavior. Given the interactive nature of e-commerce technology, much information about the consumer can be gathered in the marketplace at the moment of purchase.

personalization the targeting of marketing messages to specific individuals by adjusting the message to a person's name, interests, and past purchases

customization changing the delivered product or service based on a user's preferences or prior behavior

With the increase in information density, a great deal of information about the consumer's past purchases and behavior can be stored and used by online merchants. The result is a level of personalization and customization unthinkable with traditional commerce technologies. For instance, you may be able to shape what you see on television by selecting a channel, but you cannot change the contents of the channel you have chosen. In contrast, the online version of the *Wall Street Journal* allows you to select the type of news stories you want to see first and gives you the opportunity to be alerted when certain events happen. Personalization and customization allow firms to precisely identify market segments and adjust their messages accordingly.

SOCIAL TECHNOLOGY: USER-GENERATED CONTENT (UGC), CREATORS, AND SOCIAL NETWORKS

In a way quite different from all previous technologies, e-commerce technologies have evolved to be much more social by allowing users to create and share content with a worldwide community. Using these forms of communication, users are able to create new social networks and strengthen existing ones.

All previous mass media in modern history, including the printing press, used a broadcast (one-to-many) model: Content is created in a central location by experts (professional writers, editors, directors, actors, and producers), and audiences are concentrated in huge aggregates to consume a standardized product. The telephone would appear to be an exception, but it is not a mass communication technology. Instead, the telephone is a one-to-one technology. E-commerce technologies invert this standard media model by giving users the power to create and distribute content on a large scale and permitting users to program their own content consumption. E-commerce technologies provide a unique, many-to-many model of mass communication, and over the last several years, user-generated content (UGC), in the form of video, podcasts, newsletters, literary content, online classes, digital art, and more, has come to occupy an ever-increasing role in the online content landscape. People who develop and distribute such content are now typically referred to as "creators." More than 200 million people worldwide characterize themselves as creators, and an entire ecosystem, referred to as the creator economy, has sprung up around them. The creator economy includes social network platforms, content creation tools, monetization tools, fan interaction and community management tools, ad platforms, and administrative tools that support creators and enable them to earn revenue.

Table 1.2 provides a summary of each of the unique features of e-commerce technology and each feature's business significance.

1.4 TYPES OF E-COMMERCE

There are a number of different types of e-commerce and many different ways to characterize them. For the most part, we distinguish different types of e-commerce by the nature of the market relationship—who is selling to whom. Mobile, social, and local e-commerce can be looked at as subsets of these types of e-commerce.

TABLE 1.2 BUSINESS SIGNIFICANCE OF THE EIGHT UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY

E-COMMERCE TECHNOLOGY DIMENSION	BUSINESS SIGNIFICANCE
Ubiquity—E-commerce technology is available anytime and everywhere: at work, at home, and elsewhere via mobile devices.	The marketplace is extended beyond traditional boundaries and is removed from a temporal and geographic location. "Marketspace" is created; shopping can take place anywhere. Customer convenience is enhanced, and shopping costs are reduced.
Global reach—The technology reaches across national boundaries and around the earth.	Commerce is enabled across cultural and national boundaries seamlessly and without modification. "Marketspace" includes potentially billions of consumers and millions of businesses worldwide.
Universal standards—There is one set of technology standards.	There is a common, inexpensive, global technology foundation for businesses to use.
Richness—Video, audio, and text messages are possible.	Video, audio, and text marketing messages are integrated into a single marketing message and consuming experience.
Interactivity—The technology enables interaction with the user.	Consumers are engaged in a dialog that dynamically adjusts the experience to the individual consumer and makes the consumer a co-participant in the process of delivering goods to the market.
Information density—The technology reduces information costs and raises quality.	Information processing, storage, and communication costs drop dramatically, while currency, accuracy, and timeliness improve greatly. Information becomes plentiful, cheap, and accurate.
Personalization/Customization—The technology permits personalization and customization.	Marketing messages can be personalized and products and services customized, based on individual characteristics.
Social technology—The technology supports user-generated content (UCG), creators, and social networks.	Enables user content creation and distribution and supports development of social networks.

BUSINESS-TO-CONSUMER (B2C) E-COMMERCE

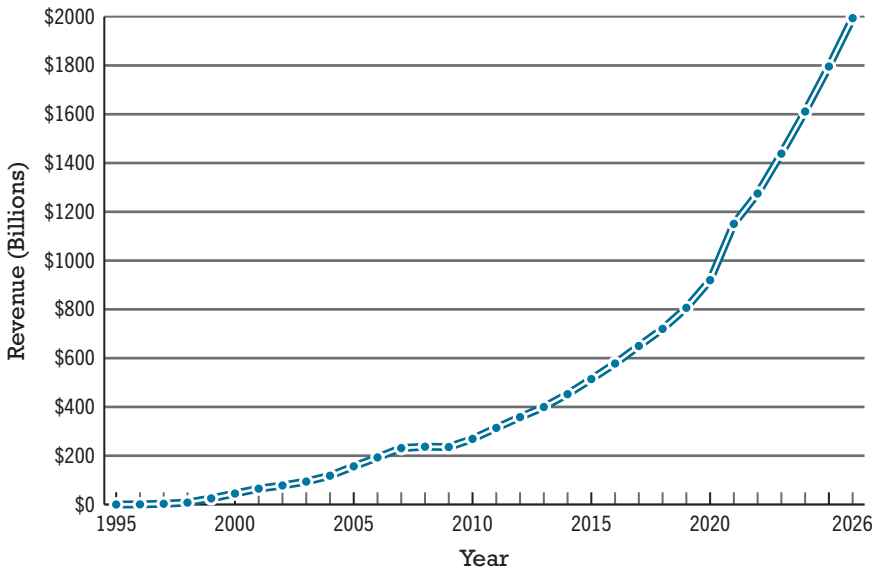
business-to-consumer (B2C) e-commerce online businesses selling to individual consumers

The most commonly discussed type of e-commerce is **business-to-consumer (B2C) e-commerce**, in which online businesses attempt to reach individual consumers. B2C e-commerce includes purchases of retail goods; travel, financial, real estate, and other types of services; and online content. B2C has grown exponentially since 1995 and is the type of e-commerce that most consumers are likely to encounter (see **Figure 1.5**).

Within the B2C category, there are many different types of business models. Chapter 2 has a detailed discussion of seven different B2C business models: online retailers, service providers, transaction brokers, content providers, community providers/social networks, market creators, and portals. Then, in Part 4, we look at each of these business models in action. In Chapter 9, we examine online retailers, service providers (including on-demand services), and transaction brokers. In Chapter 10, we focus on content providers. In Chapter 11, we look at community providers (social networks), market creators (auctions), and portals.

The data suggests that, over the next five years, B2C e-commerce in the United States will continue to grow by more than 10% annually. There is tremendous upside potential. Today, for instance, retail e-commerce (which currently comprises the

FIGURE 1.5 THE GROWTH OF B2C E-COMMERCE IN THE UNITED STATES



In the early years, B2C e-commerce was doubling or tripling each year. Although B2C e-commerce growth in the United States slowed in 2008–2009 because of the economic recession, it resumed growing at about 13% in 2010 and since then has continued to grow at double-digit rates. In 2022, revenues from B2C e-commerce are expected to reach about $1.3 trillion. (Note: does not include revenues with respect to the purchase of online content).

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022f, 2022g; U.S. Census Bureau, 2022; authors' estimates.

majority of B2C e-commerce revenues) is still only 15% of the overall $7 trillion retail market in the United States. But there is obviously still much room to grow (see **Figure 1.6**). However, it's not likely that B2C e-commerce revenues will continue to expand forever at current rates. As online sales become a larger percentage of all sales, online sales growth will likely eventually decline. However, this point still appears to be a long way off. Online content sales, everything from music to video, games, and entertainment, have an even longer period to grow before they hit any ceiling effects.

BUSINESS-TO-BUSINESS (B2B) E-COMMERCE

business-to-business (B2B) e-commerce online businesses selling to other businesses

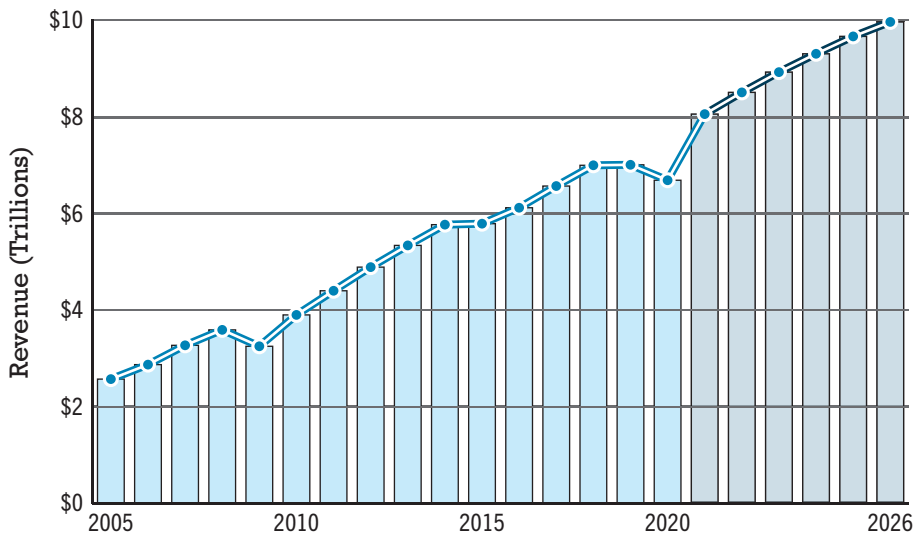
Business-to-business (B2B) e-commerce, in which businesses focus on selling to other businesses, is the largest form of e-commerce, with about $8.5 trillion in transactions in the United States projected for 2022 (see **Figure 1.7**). In 2022, there will be an estimated $16 trillion in business-to-business exchanges of all kinds, online and offline, suggesting that B2B e-commerce still has significant growth potential.

There are two primary business models used within the B2B arena: B2B e-commerce marketplaces, which include e-distributors, e-procurement companies, exchanges, and industry consortia, and private B2B networks. We review various B2B e-commerce business models in Chapter 2 and examine them in further depth in Chapter 12.

FIGURE 1.6 ROOM TO GROW

The retail e-commerce market is still just a small part of the overall U.S. retail market but has much more room to grow in the future.

FIGURE 1.7 THE GROWTH OF B2B E-COMMERCE IN THE UNITED STATES



B2B e-commerce in the United States is almost seven times the size of B2C e-commerce. In 2026, B2B e-commerce is projected to reach almost $10 trillion.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022h; U.S. Census Bureau, 2021; authors' estimates.

CONSUMER-TO-CONSUMER (C2C) E-COMMERCE

consumer-to-consumer (C2C) e-commerce
consumers selling to other consumers with the help of an online market maker

Consumer-to-consumer (C2C) e-commerce provides a way for consumers to sell to each other with the help of an online market maker (also called a platform provider). In C2C e-commerce, the consumer prepares the product for market, lists the product for auction or sale, and relies on the market maker to provide catalog, search engine, and transaction-clearing capabilities so that products can be easily displayed, discovered, and paid for. eBay, Craigslist, and Etsy were the original C2C platform provider pioneers, but today they face significant competition. For instance, third-party sales on Amazon have skyrocketed. Facebook has also entered the arena with Facebook Marketplace. There are also a number of newer entrants, such as Letgo, Offerup, TheRealReal, Poshmark, ThredUp, and Kidizen, that are focused on the C2C market. On-demand service companies such as Uber and Airbnb can also be considered C2C platform providers.

Although there are no officially reported statistics on the size of the U.S. C2C market, it is probably safe to estimate its size in 2022 as more than $200 billion (not including on-demand services), based on estimates of gross merchandise volume/sales on platforms such as eBay, Etsy, Amazon's third-party sellers, Facebook Marketplace, and Craigslist.

MOBILE E-COMMERCE (M-COMMERCE)

mobile e-commerce (m-commerce)
use of mobile devices to enable online transactions

Mobile e-commerce (m-commerce) refers to the use of mobile devices to enable online transactions. M-commerce involves the use of cellular and wireless networks to connect smartphones and tablet computers to the Internet. Once connected, mobile consumers can purchase products and services, make travel reservations, use an expanding variety of financial services, access online content, and much more.

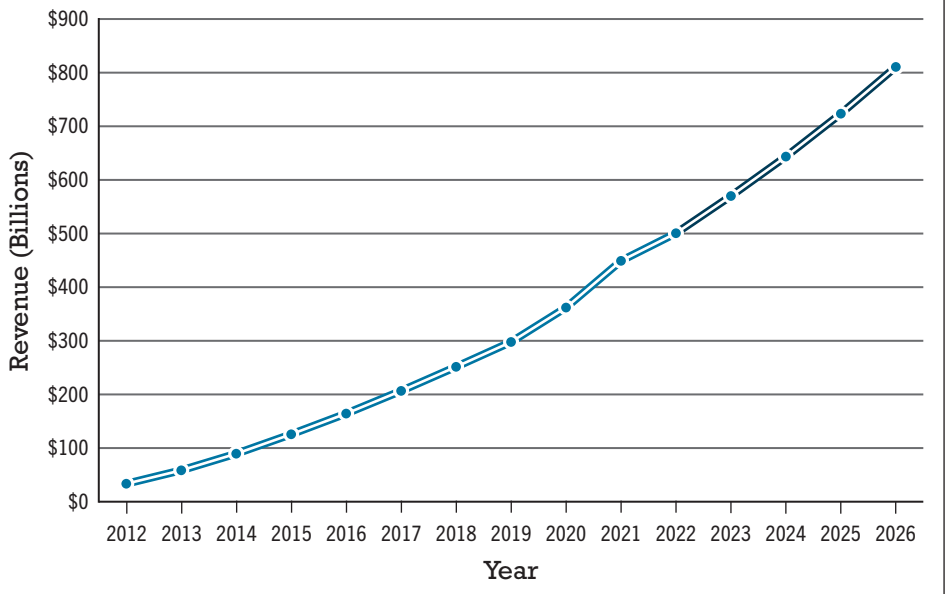
M-commerce revenues are expected to reach an estimated $500 billion in 2022. Retail m-commerce is anticipated to continue to grow by more than 12% a year between 2022 and 2026 as consumers become more and more accustomed to using mobile devices to purchase products and services. Mobile digital travel sales experienced a significant decline in 2020 because of the Covid-19 pandemic but rebounded in 2021 and are expected to top $120 billion by 2026 (see **Figure 1.8**). Factors that are driving the growth of m-commerce include the increasing amount of time consumers are spending using mobile devices, larger smartphone screen sizes, greater use of responsive design enabling websites to be better optimized for mobile use and mobile checkout and payment, and enhanced mobile search functionality (Insider Intelligence/eMarketer, 2022g, 2022i).

SOCIAL E-COMMERCE

social e-commerce
e-commerce enabled by social networks and online social relationships

Social e-commerce is e-commerce that is enabled by social networks and online social relationships. Social e-commerce is often intertwined with m-commerce, particularly as more and more social network users access those networks via mobile devices. The growth of social e-commerce is being driven by a number of factors, including the increasing popularity of social sign-on (signing onto websites using your Facebook or other social network ID), network notification (the sharing of approval or disapproval of products, services, and content), online collaborative shopping tools, social search

FIGURE 1.8 THE GROWTH OF M-COMMERCE IN THE UNITED STATES



M-commerce has increased from just $32.8 billion in 2012 to an estimated $500 billion in 2022.
SOURCES: Based on data from Insider Intelligence/eMarketer, 2022g, 2022i.

(recommendations from online trusted friends), and the increasing prevalence of integrated social commerce tools such as Buy buttons, Shopping tabs, marketplace groups, and virtual shops on Facebook, Instagram, Pinterest, TikTok, YouTube, and other social networks.

Social e-commerce is still in its relative infancy, but with social media and networks playing an increasingly important role in influencing purchase decisions and driving sales, it is continuing to grow. In 2022, it is estimated that total U.S. social retail e-commerce revenues will be around $55 billion (Insider Intelligence/eMarketer, 2022j).

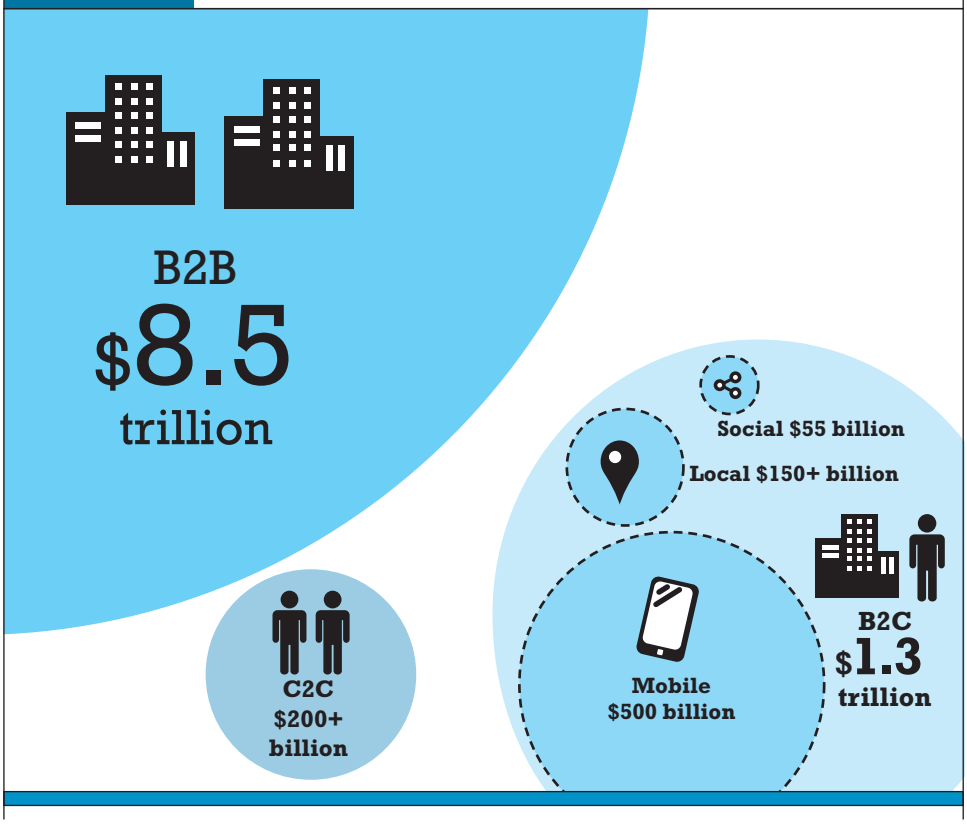
LOCAL E-COMMERCE

Local e-commerce, as its name suggests, is a form of e-commerce that is focused on engaging consumers based on their current geographic location. Local merchants use a variety of online marketing techniques to drive consumers to their stores. Local e-commerce is the third prong of the mobile, social, local e-commerce wave and, fueled by an explosion of interest in local on-demand services such as Uber and Lyft (ride services), Instacart (grocery shopping), and Grubhub and DoorDash (restaurant food delivery), is expected to grow in the United States to more than $150 billion in 2022.

local e-commerce e-commerce that is focused on engaging consumers based on their current geographic location

Figure 1.9 illustrates the relative size of all of the various types of e-commerce while **Table 1.3** provides examples for each type.

FIGURE 1.9 THE RELATIVE SIZE OF DIFFERENT TYPES OF E-COMMERCE IN 2022



B2B e-commerce dwarfs all other forms of e-commerce; mobile, social, and local e-commerce, although growing rapidly, are still relatively small in comparison to "traditional" e-commerce.

TABLE 1.3 MAJOR TYPES OF E-COMMERCE

TYPE OF E-COMMERCE	EXAMPLE
B2C—business-to-consumer	Amazon is an online retailer that sells consumer products to retail consumers.
B2B—business-to-business	Go2Paper is an independent third-party marketplace that serves the paper industry.
C2C—consumer-to-consumer	Online platforms such as eBay, Etsy, and Craigslist enable consumers to sell goods directly to other consumers. Airbnb and Uber provide similar platforms for services such as room rental and transportation.
M-commerce—mobile e-commerce	Mobile devices such as smartphones and tablet computers can be used to conduct commercial transactions.
Social e-commerce	Facebook is both the leading social network and the leading social e-commerce platform.
Local e-commerce	Groupon offers subscribers daily deals from local businesses in the form of Groupons, which are discount coupons that take effect once enough subscribers have agreed to purchase a particular item.

1.5 E-COMMERCE: A BRIEF HISTORY

It is difficult to pinpoint just when e-commerce began. There were several precursors to e-commerce. In the late 1970s, a pharmaceutical firm named Baxter Healthcare initiated a primitive form of B2B e-commerce by using a telephone-based modem that permitted hospitals to reorder supplies from Baxter. This system was later expanded during the 1980s into a PC-based remote order entry system and was widely copied throughout the United States long before the Internet became a commercial environment. The 1980s saw the development of Electronic Data Interchange (EDI) standards that permitted firms to exchange commercial documents and conduct digital commercial transactions across private networks.

In the B2C arena, the first truly large-scale digitally enabled transaction system was the Minitel, a French videotext system that combined a telephone with an eight-inch screen. The Minitel was first introduced in 1981, and by the mid-1980s, more than 3 million had been deployed, with more than 13,000 different services available, including ticket agencies, travel services, retail products, and online banking. The Minitel service continued in existence until December 31, 2006, when it was finally discontinued by its owner, France Telecom.

However, none of these precursor systems had the functionality of the Internet. Generally, when we think of e-commerce today, it is inextricably linked to the Internet. For our purposes, we will say e-commerce begins in 1995, following the appearance of the first banner advertisements placed by AT&T, Volvo, Sprint, and others on Hotwired.com, the first commercial online magazine, in late October 1994 and the first sales of banner ad space by Netscape and Infoseek in early 1995.

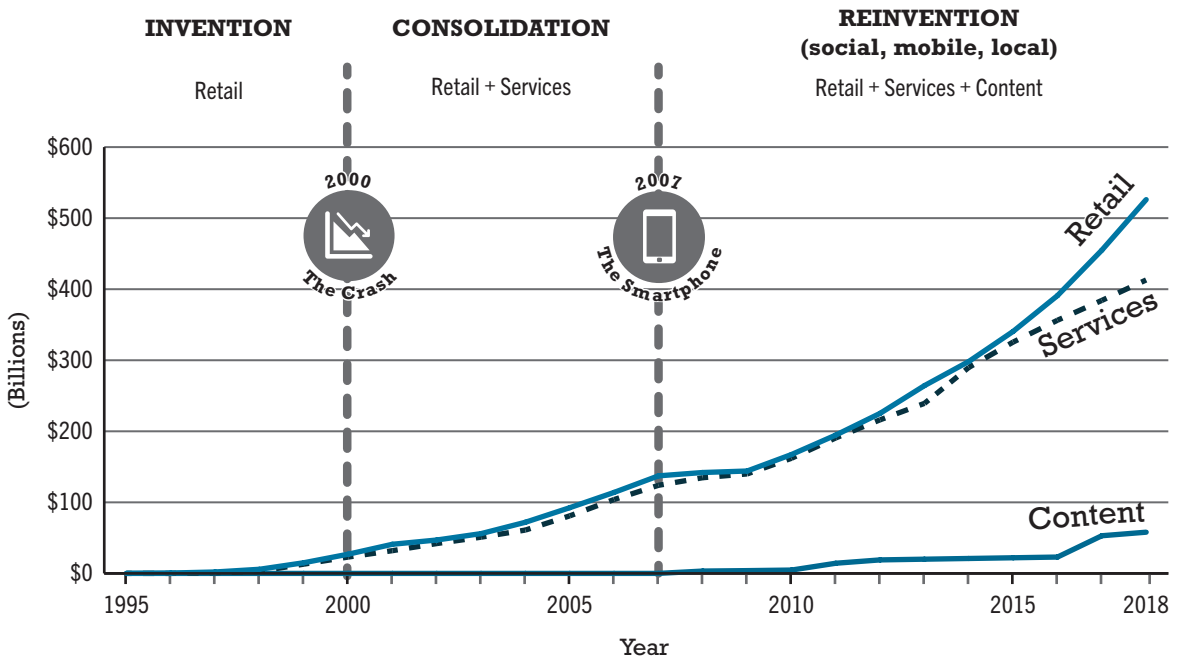
Although e-commerce is not very old, it already has had a tumultuous history, which can be usefully divided into three periods: 1995–2000, the period of invention; 2001–2006, the period of consolidation; and 2007–present, a period of reinvention with social, mobile, and local expansion. The following examines each of these periods briefly, while **Figure 1.10** places them in context along a timeline. (View the Figure 1.10 video in the eText for an animated and more detailed discussion of this figure.)

E-COMMERCE 1995–2000: INVENTION

The early years of e-commerce were a period of explosive growth and extraordinary innovation. During this Invention period, e-commerce meant selling relatively simple retail goods via the Internet. There simply was not enough bandwidth for selling more complex products. Marketing was limited to unsophisticated, static display ads and not very powerful search engines. The web policy of most large firms, if they had one at all, was to have a basic, static website depicting their brands. The rapid growth in e-commerce during the Invention period was fueled by more than $125 billion in venture capital. This period of ecommerce came to a close in 2000 when stock market valuations plunged, with thousands of companies disappearing (the "dot-com crash").

The early years of e-commerce were also one of the most euphoric of times in U.S. commercial history. It was a time when key e-commerce concepts were developed. For computer scientists and information technologists, the early success of e-commerce was a powerful vindication of a set of information technologies that had developed over

FIGURE 1.10 PERIODS IN THE DEVELOPMENT OF E-COMMERCE



a period of 40 years—extending from the development of the early Internet, to the PC, to local area networks. The vision was of a universal communications and computing environment that everyone on Earth could access with cheap, inexpensive computers—a worldwide universe of knowledge stored on HTML pages created by hundreds of millions of individuals and thousands of libraries, governments, and scientific institutes. Technologists celebrated the fact that the Internet was not controlled by anyone or any nation but was free to all. They believed that the Internet—and the e-commerce that arose based on this infrastructure—should remain a self-governed, self-regulated environment.

For economists, the early years of e-commerce raised the realistic prospect of a nearly perfect competitive market: one in which price, cost, and quality information are equally distributed; a nearly infinite set of suppliers compete against one another; and customers have access to all relevant market information worldwide. The Internet would spawn digital markets where information would be nearly perfect—something that is rarely true in other real-world markets. Merchants in turn would have equal, direct access to hundreds of millions of customers. In this near-perfect information marketspace, transaction costs would plummet because search costs—the costs of searching for prices, product descriptions, payment settlement, and order fulfillment—would all fall drastically (Bakos, 1997). For merchants, the cost of searching for customers would also fall, reducing the need for wasteful advertising. At the same time, advertisements could be personalized to the needs of every customer.

Prices and even costs would be increasingly transparent to the consumer, who could now know exactly and instantly the worldwide best price, quality, and availability of most products. Information asymmetry would be greatly reduced. Given the instant nature of Internet communications, the availability of powerful sales information systems, and the low cost involved in changing online prices (low menu costs), producers could dynamically price their products to reflect actual demand, ending the idea of one national price, or one suggested manufacturer's list price. In turn, market middlemen—the distributors and wholesalers who are intermediaries between producers and consumers, each demanding a payment and raising costs while adding little value—would disappear (**disintermediation**). Manufacturers and content originators would develop direct market relationships with their customers. The resulting intense competition, the decline of intermediaries, and the lower transaction costs would eliminate product brands and, along with these, the possibility of *monopoly profits* based on brands, geography, or special access to factors of production. Prices for products and services would fall to the point where prices covered costs of production plus a fair, "market rate" of return on capital, plus additional, small payments for entrepreneurial effort. Unfair competitive advantages (which occur when one competitor has an advantage that others cannot purchase) would be reduced, as would extraordinary returns on invested capital. This vision was called **friction-free commerce** (Smith et al., 2000).

disintermediation
displacement of market middlemen, who traditionally are intermediaries between producers and consumers, by a new, direct relationship between producers and consumers

friction-free commerce
a vision of commerce in which information is equally distributed, transaction costs are low, prices can be dynamically adjusted to reflect actual demand, intermediaries decline, and unfair competitive advantages are eliminated

For real-world entrepreneurs, their financial backers, and marketing professionals, e-commerce represented a tremendous opportunity to earn far-above-normal returns on investment. This is the exact opposite of what economists hoped for. The e-commerce marketspace represented access to millions of consumers worldwide who used the Internet and a set of marketing communications technologies (e-mail and web pages) that was universal, inexpensive, and powerful. These new technologies would permit marketers to practice what they always had done—segmenting the market into groups with different needs and price sensitivity, targeting the segments with branding and promotional messages, and positioning the product and pricing for each group—but with even more precision. In this new marketspace, extraordinary profits would go to **first movers**—those firms who were first to market in a particular area and who moved quickly to gather market share. In a "winner-take-all" market, first movers could establish a large customer base quickly, build brand name recognition early, create an entirely new distribution channel, and then inhibit competitors (new entrants) by building in *switching costs* for their customers through proprietary interface designs and features available only on one platform. The idea for entrepreneurs was to create near monopolies online based on size, convenience, selection, and brand. Online businesses using the new technology could create informative, community-like features unavailable to traditional merchants. These "communities of consumption" also would add value and be difficult for traditional merchants to imitate. The thinking was that once customers became accustomed to using a company's unique web interface and set of features, they could not easily be switched to competitors. In the best case, the entrepreneurial firm would invent proprietary technologies and techniques that almost everyone adopted, creating a network effect. A **network effect** occurs when all participants receive value from the fact that everyone else uses the same tool or product (for example, a common operating

first mover
a firm that is first to market in a particular area and that moves quickly to gather market share

network effect
occurs when users receive value from the fact that everyone else uses the same tool or product

system, telephone system, or software application such as a proprietary instant messaging standard or an operating system such as Windows), all of which increase in value as more people adopt them.[1]

To initiate this process, entrepreneurs argued that prices would have to be very low to attract customers and fend off potential competitors. E-commerce was, after all, a totally new way of shopping that would have to offer some immediate cost benefits to consumers. However, because doing business on the Web was supposedly so much more efficient when compared to traditional "bricks-and-mortar" businesses (even when compared to the direct mail catalog business) and because the costs of customer acquisition and retention would supposedly be so much lower, profits would inevitably materialize out of these efficiencies. Given these dynamics, during an online firm's early years, market share, the number of online visitors ("eyeballs"), and gross revenue were considered far more important than earnings or profits. Entrepreneurs and their financial backers expected that extraordinary profitability would come but only after several years of losses.

Thus, the early years of e-commerce were driven largely by visions of profiting from new technology, with the emphasis on quickly achieving very high market visibility. The source of financing was venture capital funds. The ideology of the period emphasized the ungoverned, "Wild West" character of the Web and the feeling that governments and courts could not possibly limit or regulate the Internet; there was also a general belief that traditional corporations were too slow and bureaucratic—too stuck in the old ways of doing business—to "get it" and be competitive in e-commerce. Young entrepreneurs were therefore the driving force behind e-commerce, backed by huge amounts of money invested by venture capitalists. The emphasis was on *disrupting* (destroying) traditional distribution channels and disintermediating existing channels, using new, purely online companies who aimed to achieve impregnable first-mover advantages. Overall, this period of e-commerce was characterized by experimentation, capitalization, and hypercompetition (Varian, 2000b).

E-COMMERCE 2001–2006: CONSOLIDATION

In the second period of e-commerce, from 2001 to 2006, a sobering period of reassessment of e-commerce occurred, with many critics doubting its long-term prospects. Emphasis shifted to a more "business-driven," rather than a technology-driven approach; large traditional firms learned how to use the Web to strengthen their market positions; brand extension and strengthening became more important than creating new brands; financing shrunk as capital markets shunned startup firms; and traditional bank financing based on profitability returned.

During this period of consolidation, e-commerce changed to include not just retail products but also more complex services such as travel and financial services. This period was enabled by widespread adoption of broadband networks in U.S. homes and businesses, coupled with the growing power and lower prices of personal computers that were the primary means of accessing the Internet, usually from work or home. Marketing on the Internet increasingly meant using search engine advertising targeted to user queries, rich media and video ads, and behavioral targeting of marketing

[1]The network effect is quantified by Metcalfe's Law, which argues that the value of a network grows by the square of the number of participants.

messages based on ad networks and auction markets. The web policy of both large and small firms expanded to include a broader "web presence" that included not just websites but also e-mail, display, and search engine campaigns; multiple websites for each product; and the creation of some limited community-feedback facilities. E-commerce in this period was growing again, by more than 10% a year.

E-COMMERCE 2007–PRESENT: REINVENTION

Beginning in 2007, with the introduction of the iPhone, to the present day, e-commerce has been transformed yet again by the rapid growth of **Web 2.0** (a set of applications and technologies that enable user-generated content such as that posted on online social networks, blogs, wikis, and video- and photo-sharing websites and apps); the widespread adoption of mobile devices such as smartphones and tablet computers; the expansion of e-commerce to include local goods and services; and the emergence of an on-demand service economy enabled by millions of apps on mobile devices and cloud computing. This period can be seen as both a sociological as well as a technological and business phenomenon.

Web 2.0
set of applications and technologies that enable user-generated content

The defining characteristics of this period are often characterized as the "social, mobile, local" online world. Entertainment content has developed as a major source of e-commerce revenues, and mobile devices have become entertainment centers as well as on-the-go shopping devices for retail goods and services. Marketing has been transformed by the increasing use of social networks and much more powerful data repositories and analytic tools for truly personalized and targeted marketing. Firms have greatly expanded their online presence by moving beyond static web pages to social networks such as Facebook, Instagram, TikTok, Twitter, and Pinterest in an attempt to surround the online consumer with coordinated marketing messages. These social networks share many common characteristics. They are inherently highly interactive, creating new opportunities for people to socially connect to others. They attract extremely large audiences (about 2.9 billion monthly active users worldwide as of July 2022 in the case of Facebook). These audiences present marketers with extraordinary opportunities for targeted marketing and advertising. Social networks also predominantly rely on user-generated content. "Regular" people (not just experts or professionals), now often referred to as creators, are producing, sharing, and broadcasting content to huge audiences, which has given rise to what has become known as the creator economy.

The reinvention of e-commerce has also resulted in a set of on-demand, personal service businesses such as Uber, Airbnb, Instacart, and DoorDash. These businesses have been able to tap into a large reservoir of unused assets (cars, spare rooms, and personal spare time) and to create lucrative markets based on the mobile platform infrastructure. More recently, the reimagining of the Internet experience in the form of the 3D, immersive experience that has been labeled the metaverse, as well as more decentralized blockchain-related concepts known as Web3, is attracting enormous attention and hype. The *Insight on Business* case, *Y Combinator's Startup Boot Camp*, takes a look at Y Combinator, a Silicon Valley incubator that over the last 15 years has successfully mentored a number of e-commerce ventures from their earliest stages to valuations of $1 billion (often called "unicorns"). Y Combinator's most recent boot camp included a number of startups focused on blockchain- and metaverse-related business models as well as more traditional B2C e-commerce and apps.

INSIGHT ON BUSINESS

Y COMBINATOR'S STARTUP BOOT CAMP

By now we've all heard stories about startups blossoming into multibillion-dollar businesses. These days, it's harder than ever to keep track of all the e-commerce companies being valued at millions and even billions of dollars, sometimes without any profits to show for themselves. But a number of them have something in common—they have been nurtured and, in some cases, whipped into shape with the help of an "incubator."

Incubators have come to occupy a vital role, helping startups move from perhaps little more than a great idea to an established, vibrant business. Y Combinator (YC) is the most well-known incubator. Twice a year, YC offers the founders of a select group of startups a three-month boot camp, complete with seed funding and mentorship from an extensive network of highly regarded tech entrepreneurs. The selection process is rigorous: There are typically thousands of applicants, and for YC's Winter 2022 class, only 414 were accepted from the 17,000 companies that had applied. Every boot camp ends with a day known as Demo Day or D Day, when each startup is given the opportunity to pitch its fledgling business to a group of wealthy venture capitalists hoping to unearth the next Facebook or Google. The Winter 2022 class's Demo Day was a virtual event because of the continuing Covid-19 pandemic, with founders pitching their companies via a slide presentation, a company description, and employee bios.

YC invests $500,000 in every company accepted into its program in exchange for a 7% stake in the company. Founders have regular meetings with YC partners and free access to technology, technical advice, emotional support, and lessons in salesmanship. As of 2022, YC has helped launch more than 3,000 startups, which together have a market capitalization of more than $600 billion. Twenty-five YC alumni companies are "unicorns" worth more than $1 billion, and 110 are worth more than $100 million. Y Combinator has been so successful that it is sometimes referred to as a "unicorn breeder."

Notable graduates include digital payment service Stripe (valued in 2022 at $95 billion); on-demand room rental service Airbnb (valued at about $60 billion); on-demand restaurant delivery service DoorDash (valued at about $25 billion); on-demand grocery delivery service Instacart (valued at about $18 billion); cloud-based file storage service Dropbox (YC's first graduate to go public); autonomous electric vehicle company Cruise (acquired by GM for $1 billion); video game streaming network Twitch (acquired by Amazon for about $1 billion); Reddit, a social news site; Weebly, a website-building platform; Coinbase, a Bitcoin wallet; Scribd, a digital library subscription service; and Codecademy, an online education service that teaches people how to program, among numerous other skills.

YC's Winter 2022 class featured a wide range of business segments. A number of startups focused on blockchain, cryptocurrencies, NFTs, and metaverse technologies. More than one-third (34%) were startups in the B2B software and services sector, focusing on technology-enabled services, marketing, and supply chains. Other significant sectors included fintech (24%), consumer goods and services (13%), and development tools (7%). The program has also broadened its geographic reach, with the Winter 2022 class including startups from 42 countries, with about 50% based outside the United States, including 34 companies from Latin America, 32 from India, and 24 focused on Africa. In addition, more than one-third (36%) of

the companies had one or more founders from an underrepresented minority.

As previously noted, blockchain-related technologies, metaverse technologies, and tools for the creator economy were the focus of many startups in the Winter 2022 class. For example, Remi Labs, based in Salt Lake City, Utah, provides everything a business needs to launch its own non-fungible tokens (NFTs). Decent allows musicians to monetize their work directly through their fans via a marketplace and infrastructure that enables them to issue NTFs collateralized by their royalties. Unai is building a VR headset designed to make virtual presence lifelike. Koala is developing a gamified metaverse platform for online tutors. LiquiFi aims to help Web3 startups manage the blockchain-based digital tokens that such companies often issue to represent ownership and compensation. Winno helps creators make money by charging subscriptions for text messages.

Other startups in that class focus on making their mark in the more traditional B2C e-commerce arena. Wantd wants to create a marketplace built specifically for power resellers in the sneaker marketplace and provides a platform for live video auctions, virtual storefronts, and bulk listing tools. Myria characterizes itself as a private marketplace for luxury "off-market" goods and services that are typically not listed online. To ensure the quality of the marketplace, Myria subjects to a serious vetting everyone seeking to join the platform. A number of other startups are focusing on e-commerce-enabling technologies. Examples include Andi, a conversational search engine with an AI assistant that can answer complex questions directly, protecting the user from spam and ad tech, and Vendo, software that helps C2C sellers crosspost items onto multiple marketplaces such as Poshmark, Etsy, eBay, and more. Apps also remain a popular focus. Discz has been characterized as one of the music industry's hottest music-recommendation apps. Discz is targeted at Gen Z and recommends songs based on past listening preferences, playing 15-second snippets of each. Discz's co-founder, Bobby Pinckney, first created a prototype of Discz as a class project during his senior year at the University of Southern California.

As part of its own continuing evolution, YC created a fund called Y Combinator Continuity to use for later-stage investments in its graduates to further guide them as their startups mature. Some of the more prominent recipients of Continuity funding include Instacart; DoorDash; Stripe; Checkr, an online background-screening platform; and Rappi, an on-demand delivery and financial services platform for Latin America. YC also supports its graduates with the YC Growth Program, which brings CEOs and founders of YC companies together for conversations that focus on issues facing companies that are growing rapidly, such as how to hire executives to help run the business as it grows and how to maintain a culture of innovation.

In 2017, Y Combinator, in an effort to further democratize the process of entrepreneurship, launched a Startup School, a free, 7-week, online MOOC (massive open online course). Since then, more than 180,000 founders have participated. Almost 70% of the founders were from outside the United States. Y Combinator feels that the program is so valuable that, in 2020, it began offering it multiple times a year. Y Combinator hopes the program will also help fuel increased applications to its boot camp.

SOURCES: "About Y Combinator," Ycombinator.com, accessed September 28, 2022; "Notable Trends from Y Combinator's Winter 2022 Demo Day," by Ryan Mendoza, Medium.com, May 10, 2022; "Everything You Need to Know about YC Winter 2022 Demo Day, Part 1," by Natasha Mascarenhas and Alyssa Stringer, Techcrunch.com, March 29, 2022; "Meet the YC Winter 2022 Batch," by Michael Seibel, Ycombinator.com, March 29, 2022; "Y Combinator Will Now Run Its Online Startup School Multiple Times per Year," by Greg Kumparek, Techcrunch.com, December 10, 2019; "Y Combinator Accelerates the Hunt for Unicorns," by Claudia Zeisberger, Knowledge.insead.edu, July 17, 2019; "Y Combinator Will Fund Later-Stage Companies," by Mike Isaac, *New York Times*, October 15, 2015; "Y Combinator Known for Picking Winners," by Heather Somerville, *San Jose Mercury News*, May 8, 2014; "Silicon Valley's Start-Up Machine," by Nathaniel Rich, *New York Times*, May 2, 2013; "What's the Secret Behind Y Combinator's Success?" by Drew Hansen, Forbes.com, February 18, 2013.

TABLE 1.4 EVOLUTION OF E-COMMERCE

1995–2000 INVENTION	2001–2006 CONSOLIDATION	2007–PRESENT REINVENTION
Technology driven	Business driven	Mobile technology enables social, local, and mobile e-commerce
Revenue growth emphasis	Earnings and profits emphasis	Audience and social network connections emphasis
Venture capital financing	Traditional financing	Return of venture capital financing; buy-outs of startups by large firms
Ungoverned	Stronger regulation and governance	Extensive government surveillance
Entrepreneurial	Large traditional firms	Entrepreneurial social, mobile, and local firms
Disintermediation	Strengthening intermediaries	Proliferation of small online intermediaries renting business processes of larger firms
Perfect markets	Imperfect markets, brands, and network effects	Continuation of online market imperfections; commodity competition in select markets
Pure online strategies	Mixed "bricks-and-clicks" strategies	Return of pure online strategies in new markets; extension of bricks-and-clicks in traditional retail markets
First-mover advantages	Strategic-follower strength; complementary assets	First-mover advantages return in new markets as traditional web players catch up
Low-complexity retail products	High-complexity retail products and services	Retail, services, and content

Table 1.4 summarizes e-commerce in each of these three periods.

ASSESSING E-COMMERCE: SUCCESSES, SURPRISES, AND FAILURES

Looking back at the evolution of e-commerce, it is apparent that e-commerce has been a stunning technological success as the Internet and the Web ramped up from a few thousand to billions of e-commerce transactions per year, and this year will generate an estimated $1.3 trillion in total B2C revenues and about $8.5 trillion in B2B revenues, with around 215 million online buyers in the United States. With enhancements and strengthening, described in later chapters, it is clear that e-commerce's digital infrastructure is solid enough to sustain significant growth in e-commerce during the next decade. The Internet scales well. The "e" in e-commerce has been an overwhelming success.

From a business perspective, though, the early years of e-commerce were a mixed success and offered many surprises. Only a very small percentage of the dot-coms formed in those early years have survived as independent companies. Yet online retail sales of goods and services are still growing very rapidly. Contrary to economists' hopes, however, online sales are increasingly concentrated. For instance, according to Insider Intelligence/eMarketer, the top-10 e-commerce retailers will grow their market share to almost 63% in 2022,

while the top-500 retailers accounted for almost 75% of all U.S. online retail sales in 2021. No one foresaw that Google/YouTube and Facebook/Instagram would dominate the online advertising marketplace, accounting for more than 50% of U.S. digital advertising revenues, or that one firm, Amazon, would account for almost 38% of all U.S. online sales via direct sales and sales by third-party sellers using Amazon's platform (Insider Intelligence/eMarketer, 2022k, 2022l; Young, 2022). And, of course, no one anticipated that a pandemic would occur in early 2020, forcing broadscale and widespread changes in consumer shopping behavior, changes that are likely to persist even after the crisis passes, fueling increased growth of retail e-commerce, particularly from the top-1,000 online retailers.

So, thousands of firms have failed, and now, a few of those that have survived dominate the market. The idea of many thousands of firms competing on price has been replaced by a market dominated by giant firms. Consumers use the Web as a powerful source of information about products they often actually purchase through other channels, such as at a physical store, a practice sometimes referred to as "webrooming," "ROBO" (research online, buy offline), or O2O (online-to-offline) (Flavian, Gurrea, and Orus, 2022). This is especially true of expensive consumer durables such as automobiles, appliances, and electronics. This offline, "Internet-influenced" commerce is very difficult to estimate but is definitely significant. For instance, Forrester Research estimates that nearly two-thirds (62%) of all U.S. retail sales are now digitally influenced, up from 49% prior to the Covid-19 pandemic (Vail, 2021). The "commerce" in "e-commerce" is basically very sound, at least in the sense of attracting a growing number of customers and generating revenues and profits for large e-commerce players.

Although e-commerce has grown at an extremely rapid pace in number of customers and amount of revenues, it is clear that many of the visions, predictions, and assertions about e-commerce that developed in the early years have not been fulfilled. For instance, economists' visions of "friction-free" commerce have not been entirely realized. Prices are sometimes lower online, but the low prices are sometimes a function of entrepreneurs selling products below their costs. In some cases, online prices are higher than those of local merchants, as consumers are willing to pay a small premium for the convenience of buying online. Consumers are also less price sensitive than expected: Surprisingly, the companies with the highest revenues often have the highest prices. There remains considerable persistent and even increasing price dispersion: Online competition has lowered prices, but price dispersion remains pervasive in many markets despite lower search costs. The concept of one world, one market, one price has not occurred in reality as entrepreneurs discover new ways to differentiate their products and services. Merchants have adjusted to the competitive Internet environment by engaging in "hit-and-run pricing" (or changing prices every day or hour using "flash pricing" or "flash sales") so that competitors never know what they are charging (neither do customers) and by making their prices hard to discover and sowing confusion among consumers by "baiting and switching" customers from low-margin products to high-margin products with supposedly "higher quality." Finally, brands remain very important in e-commerce: Consumers trust some firms more than others to deliver a high-quality product on time, and they are willing to pay for this assurance (Cavallo, 2017; Zhuang et al, 2018; Soleimani, 2021).

The "perfect competition" model of extreme market efficiency has not come to pass. Merchants and marketers are continually introducing information asymmetries. Search costs have fallen overall, but the overall transaction cost of actually completing

a purchase in e-commerce remains high because users have a bewildering number of questions to consider: Will the merchant actually deliver? What is the time frame of delivery? Does the merchant really stock this item? How do I fill out this form? Many potential e-commerce purchases are terminated in the shopping cart stage because of these consumer uncertainties. Some people still find it easier to call a trusted catalog merchant on the telephone than to order online.

Finally, intermediaries have not disappeared as predicted. Although many manufacturers do sell online directly to consumers, these manufacturers typically also make use of major e-commerce marketplaces, such as Amazon, eBay, and Walmart. If anything, e-commerce has created many opportunities for middlemen to aggregate content, products, and services and thereby introduce themselves as the "new" intermediaries. Third-party travel sites such as Travelocity, Orbitz, and Expedia are examples of this kind of intermediary.

The visions of many entrepreneurs and venture capitalists for e-commerce have not materialized exactly as predicted, either. First-mover advantage appears to have succeeded only for a very small group of companies, albeit some of them extremely well-known, such as Google, Facebook, Amazon, and eBay. Getting big quickly sometimes works but often does not. Historically, first movers have been long-term losers, with the early-to-market innovators usually being displaced by established "fast-follower" firms with the right complement of financial, marketing, legal, and production assets needed to develop mature markets; this has proved true for e-commerce as well. Many e-commerce first movers, such as eToys, FogDog (sporting goods), Webvan (groceries), and Eve.com (beauty products), failed. Customer acquisition and retention costs during the early years of e-commerce were extraordinarily high, with some firms, such as E*Trade and other financial service firms, paying up to $400 to acquire a new customer. The overall costs of doing business online—including the costs of technology, website and mobile app design and maintenance, and warehouses for fulfillment—are often no lower than the costs faced by the most efficient bricks-and-mortar stores. A large warehouse costs tens of millions of dollars regardless of a firm's online presence. The knowledge of how to run the warehouse is priceless. The startup costs can be staggering. Attempting to achieve or enhance profitability by raising prices has often led to large customer defections. From the e-commerce merchant's perspective, the "e" in "e-commerce" does not stand for "easy."

On the other hand, there have been some extraordinary and unanticipated surprises in the evolution of e-commerce. Few predicted the impact of the mobile platform. Few anticipated the rapid growth of social networks or their growing success as advertising platforms based on a more detailed understanding of personal behavior than even Google has achieved. And few, if any, anticipated the emergence of on-demand e-commerce, which enables people to use their mobile devices to order everything from taxi to grocery to laundry service.

1.6 UNDERSTANDING E-COMMERCE: ORGANIZING THEMES

Understanding e-commerce in its totality is a difficult task for students and instructors because there are so many facets to the phenomenon. No single academic discipline is prepared to encompass all of e-commerce. After teaching the e-commerce course for

a number of years and writing this book, we have come to realize just how difficult it is to "understand" e-commerce. But we have found it useful to think about e-commerce as involving three broad, interrelated themes: technology, business, and society. We do not mean to imply any ordering of importance here because this book and our thinking freely range over these themes as appropriate to the problem we are trying to understand and describe. Nevertheless, as in previous technologically driven commercial revolutions, there is a historic progression: Technologies develop first, and then those developments are exploited commercially. Once commercial exploitation of the technology becomes widespread, a host of social, cultural, and political issues arise, and society is forced to respond to them.

TECHNOLOGY: INFRASTRUCTURE

Digital computing and communications technologies are at the heart of the global digital economy we call e-commerce. To understand the likely future of e-commerce, you need a basic understanding of the information technologies upon which it is built. E-commerce is above all else a technologically driven phenomenon that relies on a host of information technologies as well as fundamental concepts from computer science developed over a 60-year period. At the core of e-commerce are the Internet and the Web, which we describe in detail in Chapter 3. Underlying these technologies are a host of complementary technologies: cloud computing, desktop computers, smartphones, tablet computers, local area networks, relational and non-relational databases, client/server computing, data mining, and fiber-optic cables, to name just a few. These technologies lie at the heart of sophisticated business computing applications such as enterprise-wide information systems, supply chain management systems, manufacturing resource planning systems, and customer relationship management systems. E-commerce relies on all these basic technologies—not just the Internet. The Internet, while representing a sharp break from prior corporate computing and communications technologies, is nevertheless just the latest development in the evolution of corporate computing and a part of the continuing chain of computer-based innovations in business.

To truly understand e-commerce, you will need to know something about packet-switched communications, protocols such as TCP/IP, client/server and cloud computing, mobile platforms, web servers, HTML5, CSS, and software programming tools such as JavaScript on the client side and Java, PHP, Ruby on Rails, and ColdFusion on the server side. All of these topics are described fully in Part 2 of the book (Chapters 3–5).

BUSINESS: BASIC CONCEPTS

While technology provides the infrastructure, it is the business applications—the potential for extraordinary returns on investment—that create the interest and excitement in e-commerce. New technologies present businesses and entrepreneurs with new ways of organizing production and transacting business. New technologies change the strategies and plans of existing firms: Old strategies are made obsolete, and new ones need to be invented. New technologies are the birthing grounds where thousands of new companies spring up with new products and services. New technologies are also the graveyard

of many traditional businesses. To truly understand e-commerce, you will need to be familiar with some key business concepts, such as the nature of digital markets, digital goods, business models, firm and industry value chains, value webs, industry structure, digital disruption, and consumer behavior in digital markets, as well as basic concepts of financial analysis. We'll examine these concepts further in Chapters 2, 6, 7, and 9 through 12.

SOCIETY: TAMING THE JUGGERNAUT

With more than 300 million people in the United States now using the Internet (many for e-commerce purposes) and with more than 4.5 billion users worldwide, the impacts of the Internet and e-commerce on society are significant and global. Increasingly, e-commerce is subject to the laws of nations and global entities. You will need to understand the pressures that global e-commerce places on contemporary society in order to conduct a successful e-commerce business or understand the e-commerce phenomenon. The primary societal issues we discuss in this book are individual privacy, intellectual property, and public policy.

Issues surrounding the preservation of privacy—the abilities of individuals to place limits on the type and amount of information collected about them and to control the uses of their personal information—have become one of the leading societal issues related to e-commerce. Read the *Insight on Society* case, *Facebook and the Age of Privacy*, to get a view of some of the ways online businesses use personal information.

Because the cost of distributing digital copies of copyrighted intellectual property, such as music, books, and videos, is nearly zero on the Internet, e-commerce poses special challenges to the various methods societies have used in the past to protect intellectual property rights.

The global nature of e-commerce also poses public policy issues regarding equity, equal access, content regulation, and taxation. For instance, in the United States, public telephone utilities are required under public utility and public accommodation laws to make basic service available at affordable rates so that everyone can have telephone service. Should these laws be extended to the Internet and the Web? If goods are purchased by a New York State resident from a website in California, shipped from a center in Illinois, and delivered to New York State, what state has the right to collect a sales tax? Should some heavy Internet users who consume extraordinary amounts of bandwidth by streaming endless movies be charged extra for service, or should the Internet be neutral with respect to usage? What rights do nation-states and their citizens have with respect to the Internet, the Web, and e-commerce? We address issues such as these in Chapter 8, and also throughout the text.

1.7 CAREERS IN E-COMMERCE

At the beginning of this chapter, in Section 1.1, we explained why studying e-commerce can help you take advantage of future opportunities. Because the digital Internet/e-commerce economy is growing rapidly and is expected to continue to do so, prospects for employment in this area are promising. Employers in this sector are looking for a

INSIGHT ON SOCIETY

FACEBOOK AND THE AGE OF PRIVACY

In a 2010 interview, Mark Zuckerberg, the founder of Facebook, proclaimed that the age of privacy had to come to an end. According to Zuckerberg, people were no longer worried about sharing their personal information online. However, many did not agree with Zuckerberg's vision. Privacy—limitations on what personal information government and private institutions can collect and use—is a founding principle of democracies. A decade's worth of privacy surveys in the United States shows that well over 80% of the public fears that the Internet and social networks such as Facebook are threats to their privacy.

Why, then, do so many people remain Facebook users and continue to share details of their lives on Facebook? Often it's because users do not realize all the data that is being collected about them and the purposes for which that data may be used. Many of Facebook's features and services are enabled by default, and a study by Siegel+Gale found that Facebook's privacy policy is more difficult to comprehend than are government notices or typical bank credit card agreements, which are notoriously dense.

Facebook's business model is based on building a database of billions of users who are encouraged, or perhaps even deceived, into relinquishing control over personal information, which is then sold to advertisers and other third-party developers. The less privacy Facebook's users want or have, the more Facebook profits. Eliminating personal information privacy is built into Facebook's DNA and business model.

Zuckerberg's remarks have haunted Facebook over the past decade as the company has faced continual crises related to privacy. Third-party developers, advertisers, and Facebook employees and executives have known for years about Facebook's practice of sharing users' personal information with whomever would pay, but little of this was known by the public until the so-called Cambridge Analytica scandal that first came to light in 2018. Aleksandr Kogan, a psychology professor at Cambridge University, had obtained permission from Facebook to use the personal information of Facebook users as part of a research project on psychological profiles. Kogan used a personality quiz app that was downloaded by around 300,000 participants to collect the data, which ultimately included information about not only the participants but also about their friends as well as their friends' friends. The result was a database of profiles of more than 87 million Facebook users! Cambridge Analytica, a political and data analytics firm, obtained access to these profiles from Kogan and then used them to target political ads. These revelations led to congressional hearings in which Zuckerberg and other executives apologized for Facebook's failure to enforce its own privacy policies, its failure to recognize the massive drain of personal information on 87 million users, and its failure to protect the privacy of its users.

Public confidence in Facebook was further shaken when it was revealed that Facebook had data-sharing agreements with at least 60 phone and device makers (including Apple, Amazon, Microsoft, and Samsung) that allowed these firms access to virtually all the personal information Facebook collected on its on users. In addition, the personal data of users' friends was also shared, even when these friends had used Facebook's privacy controls to explicitly choose not to have their data shared. For instance, a *New York Times*

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reporter investigated an app called The Hub that let users view all their messages and social media accounts in one location. The investigation revealed that the Hub app could access detailed data about the reporter and 556 of her friends, as well as on 294,000 friends of the reporter's friends, without their consent and without regard to their Facebook privacy settings! Spokespersons for the device makers either declined to comment or claimed they used the information solely to provide an effective user experience.

Not long thereafter, a *Wall Street Journal* exposé revealed that a number of popular smartphone apps shared personal information with Facebook even when the user wasn't a Facebook user and without specifically disclosing that they had done so. For instance, the most popular heart-rate iOS app shared data about a user's heart rate with Facebook immediately after it was recorded. A Realtor.com app sent Facebook the location and price of listings that a user viewed, also noting the user's favorites. Facebook then used the data to personalize ads and content on Facebook. It was also revealed that Facebook had suspended about 10,000 different apps for potentially misusing Facebook users' personal data, raising further questions about Facebook's failures to protect its users' privacy.

In 2020, Facebook was finally forced to pay a price for its failures. A federal court approved a $5 billion fine imposed by the Federal Trade Commission to settle charges that Facebook had violated a previous FTC order requiring Facebook to obtain user consent before overriding user privacy preferences, to stop making false statements about how much information was shared with third-party developers, to stop falsely claiming that users could restrict sharing of data to limited audiences, and to stop falsely claiming that it did not share deep personal information with advertisers. Facebook also had to agree to new restrictions on its business operations and to restructure its approach to privacy, establishing mechanisms that would supposedly ensure that Facebook and its executives would be held accountable for the decisions made about privacy. Critics charged that although the fine was the largest ever imposed on a company for violating consumer privacy, it was largely meaningless, given Facebook's overall revenues and also given Facebook's failure to comply with similar orders in the past.

However, Facebook's future may rely on how it responds to its ethical challenges such as these going forward. Over the last several years, there has been an increasing focus on ethical business practices and a growing awareness that good ethics is good business. The ESG (environmental, social, and governance) movement, which focuses on a company's performance beyond just profit and loss, is gaining increased traction and becoming a strategic business imperative. Facebook says it is taking a number of steps to respond to these challenges. However, given that Facebook's business model relies almost entirely on the largely unfettered use of users' personal information and given its past history and business practices, it is unclear whether Facebook can be trusted.

SOURCES: "Meta Investor Relations: Environmental Social Governance Resources," Investor.fb.com, accessed September 29, 2022; "Meta Platforms Inc. Form 10-K for the fiscal year ended December 31, 2021, Sec.gov, February 3, 2022; "A Timeline of Trouble: Facebook's Privacy Record and Regulatory Fines," Guild.co, August 4, 2021; "Facebook's $5 Billion Privacy Settlement Wins Court Approval," by Ryan Tracy, *Wall Street Journal*, April 24, 2020; "Facebook's Suspension of 'Tens of Thousands' of Apps Reveals Wider Privacy Issues," by Kate Conger, Gabriel Dance, and Mike Isaac, *New York Times*, September 20, 2019; "A $5 Billion Fine for Facebook Won't Fix Privacy," *New York Times*, July 25, 2019; "You Give Apps Sensitive Personal Information. Then They Tell Facebook," by Sam Schechner and Mark Secada, *Wall Street Journal*, February 22, 2019; "Facebook's Latest Problem: It Can't Track Where Much of the Data Went," by Deepa Seetharaman, *Wall Street Journal*, June 27, 2018; "Facebook Gave Device Makers Deep Access to Data on Users and Friends," by Gabriel Dance, Nicholas Confessore, and Michael LaForgian, *New York Times*, June 3, 2018; "Facebook Says Cambridge Analytica Harvested Data of Up to 87 Million Users," by Cecilia Kang and Sheera Frenkel, *New York Times*, April 24, 2018.

wide variety of skills, and having a familiarity with the vocabulary—as well as with the concepts—underlying e-commerce can help you as you interview and also on the job.

To illustrate, we will conclude each chapter with a section that examines an example job posting by an e-commerce company for an entry-level position. We will give you a brief overview of the company, some details about the position, and a list of the qualifications and skills that are typically required and then follow up with some tips about how to prepare for an interview as well as show you how concepts you've learned in the chapter can help you answer some possible interview questions. In this chapter, we look at a job posting from one of the most familiar types of e-commerce companies: an online retailer.

THE COMPANY

The company is a large national retailer that is rapidly expanding its online and mobile operations. The company is seeking to develop omnichannel e-commerce capabilities based on world-class pricing technology, automated warehouses, and an advanced fulfillment program that combines its retail stores with its online and mobile sales. The company has hundreds of different product categories and operates multiple branded websites.

POSITION: CATEGORY SPECIALIST IN THE E-COMMERCE RETAIL PROGRAM

You will manage the performance of your category of products across the firm's websites and apps. More specifically, you will:

- Manage and monitor the introduction of new products and establish processes to ensure they are available at stores and online.
- Improve the online user experiences of browsing and searching for products.
- Manage item and category pages including graphics, customer reviews, and content. Find new ways in which our customers can discover products online.
- Optimize the pricing of our products, and benchmark competitors' prices.
- Analyze product performance, identify key trends, and suggest how the firm can improve its revenues, customer service, and margins.
- Work with cross-functional teams in marketing, customer relationship management, and supply chain management to execute initiatives to optimize category performance.

QUALIFICATIONS/SKILLS

- Bachelor's degree with a strong academic background
- An entrepreneurial attitude
- Strong attention to detail
- Strong communication and teamwork skills
- Strong analytical and critical-thinking skills
- Ability to work in a fast-paced environment, face challenges, and solve problems

- Negotiation and persuasion skills
- Fast learner, with the abilities to absorb information and experiences and then apply them

PREPARING FOR THE INTERVIEW

The first step in preparing for an interview is to do some research about the company you will be interviewing with as well as about the industry in general. Visit the company's websites, apps, and social media presence. It would also be helpful to review Sections 1.2 and 1.3 so that you can demonstrate an understanding of the basic concepts underlying e-commerce, show that you are aware of some of the major trends that will be impacting e-commerce in the coming year, and demonstrate that you are familiar with the basic features underlying e-commerce technology. Being able to talk about the different types of e-commerce (covered in Section 1.4), especially the growing importance of m-commerce, should also be helpful. Before the interview, you should consider where your background, such as courses taken, outside activities, and personal interests, can be useful to the company's business objectives. Reread the position description and identify where you may have unique skills.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. We hope to build an omnichannel presence where consumers can buy our products online or in our physical stores, which will also have in-store kiosks where customers can explore and order products. What challenges do you think you will face when introducing products to an omnichannel store?

You can prepare for this type of question by visiting national retail stores that already have an omnichannel presence and being prepared to report on your experience as a consumer. Some of the key challenges include providing a consistent customer experience across channels, coordinating pricing, and integrating physical store sales teams with efforts from online marketing teams.

2. Based on what you already know about our online presence, how do you think we should expand our online activities?

You could reference the explosive growth in smartphones and m-commerce, as well as the growth in social networks, and suggest that the firm expand its mobile and social network presence.

3. We're finding that quite a few of our customers come to our website to see our offerings and then buy them on Amazon. How do you think our firm can respond to this situation?

You could approach this question by explaining why so many people use Amazon: a great product search engine, an interface that's easy to use, a convenient payment process, Prime shipping, and low prices. This suggests that the firm should develop websites and a mobile app that match Amazon's features.

4. How can our company use social networks such as Facebook, Instagram, TikTok, Twitter, and Pinterest to expand our business?

You could respond to this by noting that social networks are excellent branding and product introduction tools but that purchases are more likely to be made on the company's website.

5. We gather a tremendous amount of personal information about our online customers. What kinds of issues do you think this poses for our company?

You could address this question by referencing the concerns that people have about their private communications, online transactions, and postings being kept private unless they grant permission for the release of this personal information. You may have had some personal experiences online where you felt your privacy was being invaded. Talk about these experiences.

6. Our online sales have grown at about 20% a year for several years. Yet many of our customers also buy from our retail stores, sometimes based on what they see online. Do you think our e-commerce channel will continue expanding at this rate in the future?

You can address this question by pointing out that e-commerce currently is still a relatively small part of total retail commerce and that you therefore believe there is plenty of room for e-commerce to keep growing rapidly in the future. The firm's online presence will likely drive in-store purchases.

7. Have you ever worked on the development of a website or app for a business or started an online business yourself? How did it work out?

Here, you will have to draw on your personal experiences, or those of friends, in using the Web to promote a business. If you've had some experience you can share, be prepared to identify what made these efforts successful as well as what the challenges were and what mistakes you made. Failure is a valuable experience to share with interviewers because it shows you tried. If you have no experience, you can talk about an idea for an e-commerce company that you have thought about and how you would turn it into a successful business.

1.8 CASE STUDY

Uber:

Everything on Demand

If you were asked to pick iconic examples of e-commerce through the years since it began, it is likely that companies such as Amazon, Google, Apple, Facebook, and Netflix would be high on your list. But during the last decade or so, a different breed of e-commerce company, focused on the provision of on-demand services, has muscled its way into the mix.

Uber is perhaps the most well-known company that uses the on-demand service model. Uber's business model differs from traditional retail e-commerce business models. Uber doesn't sell goods. Instead, it created a smartphone app/Internet cloud-based platform that enables people who want taxi service—like hailing a taxi—to find a provider with the resources, such as a personal automobile and a driver with available time, to fill the demand. It's important to understand that although Uber and similar firms are often called "sharing economy" companies, this is a misnomer. Uber drivers are selling their services as drivers and the temporary use of their cars. Uber itself is not in the sharing business, either: It charges a 20% commission on every transaction on its platform. Uber is also not an example of true "peer-to-peer" e-commerce because Uber transactions involve an online intermediary: a third party that provides a platform for, and takes a cut of, all transactions.

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Uber offers a compelling value proposition for both customers and drivers. Customers can download the Uber app for free. There is also a specialized app for drivers. To find a ride, the customer opens the app and enters a destination. The app shows an estimated, upfront price for the ride as well as options for vehicle size and estimated drop-off time. The customer then chooses the desired options and confirms the trip. Nearby drivers get an in-app notification on their Driver app and can choose whether to accept the ride request. The customer is automatically notified when the driver's vehicle is about a minute away, thus eliminating the need to stand on a street corner frantically waving, competing with others, or waiting endlessly for an available cab to drive by without knowing when that might happen. Uber provides a variety of payment options, including a stored credit or debit card, Uber Cash (a stored payment method), Apple Pay, Google Pay, PayPal, Venmo, and, in some areas, even cash. At the end of each ride, drivers and riders review the ride based on a five-star rating system. Drivers that fall below a certain rating (4.6/4.5) are warned that they may be dropped if they don't improve. Customers that have high ratings are likely to be prioritized by drivers, who can refuse to pick up customers with low ratings. Uber's value proposition for drivers is that it allows them to set their own hours, work when they like, and put their own cars to use generating revenue. Today Uber operates in around 10,000 cities in 72 countries around the world, with an estimated 4 million drivers and around 115 million riders per month.

Uber has disrupted the traditional taxi business model because it offers a superior, fast, convenient taxi-hailing service when compared to what traditional taxi companies provide. With a traditional taxi service, there is no guarantee that you will find a cab. Uber significantly reduces that uncertainty, although consumers can still sometimes be impacted by availability issues: During a rainstorm, a convention, or a sports event, when demand peaks, not enough drivers may be available at any price. Uber also charges prices that vary dynamically with demand: the higher the demand, the greater the price of a ride. Therefore, it is impossible using public information to know if Uber's prices are lower than traditional taxi prices. Clearly, in high-demand situations Uber's prices are higher, sometimes 10 times higher, than a regulated taxi's prices. However, there is no regulatory taxi commission setting uniform, per-mile fares.

Uber's business model is also much more efficient than a traditional taxi firm's. Uber has shifted the costs of running a taxi service entirely to the drivers. Uber does not own taxis and does not provide fuel, insurance, or maintenance for its drivers' cars, something that has become increasingly problematic in 2022 as fuel prices dramatically escalated. Although Uber began adding a fuel surcharge in March 2022 of between 35 to 55 cents per ride or delivery, drivers say that it is far from adequate. Drivers must also use their own smartphones and cell service. Uber classifies its drivers as independent contractors (often referred to as "gig workers"), not as employees; and rather than paying them a salary, Uber gives drivers a cut of each fare. Doing so enables Uber to avoid costs for social security, workers' compensation, minimum wage requirements, driver training, health insurance, and commercial licensing.

If Uber is the poster child for the on-demand service economy, it's also an iconic example of the social costs and conflicts associated with this kind of e-commerce. The classification of its drivers as independent contractors, which significantly reduces Uber's costs, is currently being challenged in courts, by legislators, and by government agencies in the United States and around the world. Uber is apparently so desperate to

maintain this classification of its drivers that it is backing bills that would classify its drivers as independent contractors in exchange for agreeing not to try to block their efforts to unionize. Uber has also been the target of numerous lawsuits filed on behalf of its drivers, accusing the company of mistreatment, lack of due process, underpayment, and violation of state employment laws.

Even governments find Uber to be a disruptive threat. Governments do not want to give up regulatory control over passenger safety, driver training, or the healthy revenue stream generated by charging taxi firms for a taxi license and sales taxes. Uber has been accused of violating public transportation laws and regulations throughout the world; abusing the personal information it has collected on users of the service; seeking to use personal information to intimidate journalists; failing to protect public safety by refusing to do adequate criminal, medical, and financial background checks on its drivers; taking clandestine actions against its chief U.S.-based competitor, Lyft, in order to disrupt its business; and being tone-deaf to the complaints of its own drivers against the firm's efforts to reduce driver fees. Uber has been banned in several European cities. For instance, in London, Transport for London, the regulatory body that governs taxi services in London, has repeatedly tried to revoke Uber's license to operate, based on concerns about user safety. Currently, Uber is operating under a 30-month license, after adding a number of safety features, such as an in-app panic button. More significantly, the Court of Justice of the European Union, the European Union's most powerful court, has ruled that Uber should be treated as a transportation service—and be subject to all of the existing laws and regulations that apply to such services in the EU member countries in which it operates—rather than as a digital platform not subject to such laws and regulations, as Uber had been attempting to assert.

Critics also fear the long-term impact of on-demand service firms because of their potential for creating a society of part-time, low-paid, temp work displacing traditionally full-time, secure jobs—the so-called "uberization" of work. As one critic put it, Uber is not the Uber for rides as much as it is the Uber for low-paid jobs. A study by the MIT Center for Energy and Environmental Policy Research found that after taking into account costs such as fuel, insurance, maintenance, and repairs, Uber drivers earn less than the minimum wage. Uber contends that it is lowering the cost of transportation, making better use of spare human and financial resources, expanding the demand for ride services, and expanding opportunities for car drivers, whose pay it claims is about the same as that of other taxi drivers. Uber has also taken some remediating steps. It enhanced its app to make it easier for drivers to take breaks while they are on the job. Drivers can now also be paid instantly for each ride they complete rather than weekly and see on the app's dashboard how much they have earned. In addition, Uber added an option to its app that allows passengers to tip its U.S. drivers.

Over the last several years, Uber has been hit by a series of continuing controversies and scandals, creating a public relations nightmare for the company and culminating in the resignation of a number of board members, senior executives, and finally its co-founder and CEO, Travis Kalanick. It was charged with corporate mismanagement and misconduct (including using a secret program known as Greyball to track and evade regulators and other law enforcement officials), workplace discrimination and sexual harassment, and violation of the privacy of its customers by using its mobile app to track the location of those customers at all times, even when the app was not in use.

In December 2021, its former chief security officer was charged with wire fraud in addition to a previous obstruction of justice charge related to his role in an alleged cover-up of a data breach at Uber that exposed approximately 57 million user and driver records. In July 2022, the *Washington Post* announced its participation in an international journalistic investigation into Uber's alleged use of stealth technology to thwart regulators and law enforcement in order to assist its expansion throughout the world. The project is based on more than 124,000 e-mails, text messages, memos, and other records. In a statement in response to the investigation, Uber admitted to "mistakes and missteps," but said it had been transformed under the leadership of its current chief executive, Dara Khosrowshahi.

Despite the controversy surrounding it, Uber continues to attract drivers, customers, and additional investors. In 2019, Uber went public, raising more than $8 billion at a valuation of about $82 billion, which although a staggering amount, was well below the $120 billion value initially floated by its investment bankers. During 2019, Uber's stock price declined significantly, losing almost half its value since the IPO. Then came the Covid-19 pandemic, which has had an adverse impact on Uber's business, drastically reducing the demand for ride services. In 2021, it recorded an operating loss of $3.8 billion, and it has accumulated a deficit of an astounding $23.6 billion. As of mid-2022, demand has not yet recovered to pre-pandemic levels, although its financial results for this segment improved compared to 2020's. It has also experienced a shortage of drivers as a result of the pandemic.

Although Uber began business solely as an alternative to traditional taxis, it has expanded its horizons to envisioning itself as a platform for a variety of different services associated with the movement of people and things from one point to another. While its flagship offering is still what it refers to as mobility services that provide rides for consumers in a variety of vehicles, it now also is almost as equally focused on restaurant food delivery services (Uber Eats) and freight services (Uber Freight). It sees itself as the "Amazon" of transportation, with the potential to become the dominant force in all forms of transportation. But Uber faces significant challenges in each of these areas.

In the wake of the pandemic, Uber turned to Uber Eats, its online food-ordering and delivery service, which became much more in demand. In December 2020, after an attempt to acquire food delivery service Grubhub failed to come to fruition, Uber instead acquired competitor Postmates for $2.65 billion, It had previously acquired Careem, a rival in the Middle East, for $3.1 billion. Uber's revenues from its food-delivery services now outpace its mobility segment, accounting for $8.3 billion in revenue, although it too continues to operate at a loss. Uber faces stiff competition in the delivery business, including from DoorDash, Deliveroo, Instacart, Grubhub, and many others. In a sign that Uber may be finding it hard to let go of its dreams of dominating all sorts of transportation-related services, it has recently announced a variety of new features for Uber Eats that expand its core value proposition. For instance, it has partnered with a direct-to-consumer telehealth company to deliver health and wellness products in 12 markets across the United States via the Uber Eats app. It has also teamed up with digital pharmacy startups to deliver prescription medications. In May 2022, it announced an expansion of its partnerships with Albertsons to include grocery delivery for more than 2,000 Albertsons stores.

One of Uber's newer lines of business is its Uber Freight segment, which it launched in 2017. Uber is aiming to revolutionize the logistics industry in much the same way it

SOURCES: "About the Uber Files Investigation," by *Washington Post* Staff, Washingtonpost.com, July 11, 2022; "'We Will Not Make Excuses': Uber Responds to Uber Files Leak," Theguardian.com, July 10, 2022; "Form 10-Q for the Quarterly Period Ended March 31, 2022," Uber Technologies, Inc., Sec.gov, May 5, 2022; "Uber Continues Its Recovery from the Pandemic Lull but Loses $5.6 Billion from Investments," by Kellen Browning, *New York Times*, May 4, 2022; "Uber Granted 30-Month License to Continue Operating in London," by Emma Roth, Theverge.com, March 26, 2022; "Uber Drivers Are Slamming the Company's Fuel Surcharge as 'Woefully Inadequate,'" by Gabrielle Bienasz, Businessinsider.com, March 16, 2022; "Gig Worker-focused Business Models Face a Host of Challenges," by Zak Stambor, Insider Intelligence/eMarketer, March 9, 2022; "Form 10-K for the Fiscal Year Ended December 31, 2021," Uber Technologies, Inc., Sec.gov, February 24, 2022; "Former Uber Security Officer to Face Wire Fraud Charges," by Rhea Patel, Justice.gov, December 22, 2021; "Uber Acquires Food Delivery Service Postmates for $2.65B," by Stephanie Mlot, Pcmag.com, July 6, 2020; "Uber Unveils New Safety Features Amid Scathing Report," Cbsnews.com, September 26, 2019; "Culture Crossover: Uber Impact: The Cost and Disruption and Monopoly," by Somrata Sarkar, Techworld.com, May 17, 2019; "How the Promise of a $120 Billion Uber IPO Evaporated," by Mike Isaac, Michael J. de la Merced, and Andrew Ross Sorkin, *New York Times*, May 15, 2019; Eliot Brown, "Uber Wants to Be the Uber of Everything—But Can It Make a Profit?" *Wall Street Journal*, May 4, 2019; "MIT Study Shows How Much Driving for Uber or Lyft Sucks," by Natasha Lomas, Yahoo.com, March 2, 2018; "Uber Dealt Setback after European Court Rules It Is a Taxi Service," by Liz Alderman, *New York Times*, December 20, 2017; "Here's All the Shady Stuff Uber's Been Accused of So Far," by Joe McGauley,

Thrillist.com, March 7, 2017; "An Uber Shakedown," *Wall Street Journal*, April 24, 2016; "Uber Settlement Takes Customers for a Ride," by Rob Berger, *Forbes*, April 22, 2016; "Twisting Words to Make 'Sharing' Apps Seem Selfless," by Natasha Singer, *New York Times*, August 9, 2015; "How Everyone Misjudges the Sharing Economy," by Christopher Mims, *Wall Street Journal*, May 25, 2015; "The On-Demand Economy Is Reshaping Companies and Careers," *The Economist*, January 4, 2015; "The On-Demand Economy: Workers on Tap," *The Economist*, January 3, 2015.

revolutionized the ride-hailing business: by providing an on-demand platform to automate logistics transactions. The platform connects shippers with carriers and gives shippers upfront, transparent pricing; the ability to book a shipment with just a few clicks; and the ability to track shipments in real time from pickup to delivery. To date, Uber has invested heavily in its Freight segment, and in 2021, it acquired Transplace, a managed transportation and logistics network, for $2.25 billion. Like Uber's other lines of business, Uber Freight's revenue is growing, particularly as a result of its acquisition of Transplace, but it is still operating at a loss. Uber Freight also faces significant competition from a number of already-entrenched global and North American freight brokers.

In May 2022, Uber released its financial results for the first quarter of 2022. It was in many senses a promising report, as revenue for all of its segments grew to $6.9 billion. But it once again recorded a loss from operations. Will Uber ever be able to consistently turn a profit?

Case Study Questions

1. How does an on-demand services business model such as Uber's differ from a retail e-commerce business model?
2. What ethical and social issues are raised by Uber and its business model?
3. What unique features of e-commerce technology does Uber's business model rely on?

1.9 REVIEW

KEY CONCEPTS

■ Understand why it is important to study e-commerce.

- The next five years hold out exciting opportunities—as well as risks—for new and traditional businesses to exploit digital technology for market advantage. It is important to study e-commerce in order to be able to perceive and understand these opportunities and the risks that lie ahead.

■ Define e-commerce, understand how e-commerce differs from e-business, identify the primary technological building blocks underlying e-commerce, and recognize major current themes in e-commerce.

- E-commerce involves digitally enabled commercial transactions between and among organizations and individuals.
- E-business refers primarily to the digital enabling of transactions and processes within a firm, involving information systems under the control of the firm. For the most part, unlike e-commerce, e-business does not involve commercial transactions across organizational boundaries where value is exchanged.
- The technology juggernauts behind e-commerce are the Internet, the Web, and the mobile platform.
- From a business perspective, one of the most important trends to note is that all forms of e-commerce continue to show very strong growth. From a technology perspective, the mobile platform has finally arrived with a bang, driving growth in mobile advertising and making true mobile e-commerce a reality. At a societal level, major issues include privacy and government surveillance, protection of intellectual property, online security, and governance of the Internet.

Identify and describe the unique features of e-commerce technology and discuss their business significance.

There are eight features of e-commerce technology that are unique to this medium:

- *Ubiquity*—available just about everywhere and at all times, making it possible to shop from your desktop, at home, at work, or even in your car.
- *Global reach*—permits commercial transactions to cross cultural and national boundaries far more conveniently and cost-effectively than is true in traditional commerce.
- *Universal standards*—shared by all nations around the world, in contrast to most traditional commerce technologies, which differ from one nation to the next.
- *Richness*—enables an online merchant to deliver marketing messages in a way not possible with traditional commerce technologies.
- *Interactivity*—allows for two-way communication between merchant and consumer and enables the merchant to engage a consumer in ways similar to a face-to-face experience but on a much more massive, global scale.
- *Information density*—the total amount and quality of information available to all market participants. The Internet reduces information collection, storage, processing, and communication costs while increasing the currency, accuracy, and timeliness of information.
- *Personalization and customization*—the increase in information density enables a level of personalization and customization unthinkable with previously existing commerce technologies.
- *Social technology*—provides a many-to-many model of mass communications. Millions of users are able to generate content consumed by millions of other users. The result is the formation of social networks on a wide scale and the aggregation of large audiences on social network platforms.

Describe the major types of e-commerce.

There are six major types of e-commerce:

- *B2C e-commerce* involves online businesses selling to consumers and is the type of e-commerce that most consumers are likely to encounter.
- *B2B e-commerce* involves online businesses selling to other businesses and is the largest form of e-commerce.
- *C2C e-commerce* is a means for consumers to sell to each other with the help of an online market maker.
- *M-commerce* involves the use of mobile devices to enable online transactions.
- *Social e-commerce* is e-commerce that is enabled by social networks and online social relationships.
- *Local e-commerce* is a form of e-commerce that is focused on engaging consumers based on their current geographic location.

Understand the evolution of e-commerce from its early years to today.

E-commerce has gone through three stages: invention, consolidation, and reinvention.

- The early years of e-commerce were a technological success, with the digital infrastructure created during the period solid enough to sustain significant growth in e-commerce during the next decade, and mixed business success, with significant revenue growth and customer usage but low profit margins.
- E-commerce entered a period of consolidation beginning in 2001 and extending into 2006.
- E-commerce entered a period of reinvention in 2007 with the emergence of the mobile platform, social networks, and Web 2.0 applications that attracted huge audiences in a very short time span.

Describe the major themes underlying the study of e-commerce.

E-commerce involves three broad, interrelated themes:

- *Technology*—To understand e-commerce, you need a basic understanding of the information technologies upon which e-commerce is built, including the Internet, the Web, the mobile platform, and a host of complementary technologies—cloud computing, desktop computers, smartphones, tablet computers, local area networks, client/server computing, packet-switched communications, protocols such as TCP/IP, web servers, HTML, and relational and non-relational databases, among others.
- *Business*—While technology provides the infrastructure, it is the business applications—the potential for extraordinary returns on investment—that create the interest and excitement in e-commerce. Therefore, you

also need to understand some key business concepts such as digital markets, information goods, business models, firm and industry value chains, industry structure, and consumer behavior in digital markets.

- *Society*—Understanding the pressures that global e-commerce places on contemporary society is critical to being successful in the e-commerce marketplace. The primary societal issues are intellectual property, individual privacy, and public policy.

QUESTIONS

1. What is e-commerce? How does it differ from e-business? Where does it intersect with e-business?
2. What is information asymmetry?
3. What are some of the unique features of e-commerce technology?
4. What is a marketspace?
5. What are three benefits of universal standards?
6. Compare online and traditional transactions in terms of richness.
7. Name three of the business consequences that can result from growth in information density.
8. What is Web 2.0? Give examples of Web 2.0 websites or apps, and explain why you included them in your list.
9. Give examples, besides those listed in the chapter materials, of B2C, B2B, C2C, and social, mobile, and local e-commerce.
10. How are e-commerce technologies similar to or different from other technologies that have changed commerce in the past?
11. Describe the three different stages in the evolution of e-commerce.
12. Define disintermediation, and explain the benefits to Internet users of such a phenomenon. How does disintermediation impact friction-free commerce?
13. What are some of the major advantages and disadvantages of being a first mover?
14. What is a network effect, and why is it valuable?
15. Discuss the ways in which the early years of e-commerce can be considered both a success and a failure.
16. What are five of the major differences between the early years of e-commerce and today's e-commerce?
17. What are some of the privacy issues that Facebook has created?
18. Discus the impacts of the Covid-19 pandemic on retail e-commerce and m-commerce.
19. What platform do the majority of Internet users in the United States use to access the Internet?
20. What is the metaverse?

PROJECTS

1. Choose an e-commerce company, and assess it in terms of the eight unique features of e-commerce technology described in Table 1.2. Which of the features does the company implement well, and which features does it implement poorly, in your opinion? Prepare a short memo to the president of the company you have chosen, detailing your findings and any suggestions for improvement you may have.

2. Search online for an example of each of the major types of e-commerce described in Section 1.4 and listed in Table 1.3. Create a presentation or written report describing each company (take a screenshot of each home page, if possible), and explain why it fits into the category of e-commerce to which you have assigned it.

3. Given the development and history of e-commerce in the years 1995–2022, what do you predict we will see during the next five to seven years of e-commerce? Describe some of the technological, business, and societal shifts that may occur as the Internet continues to grow and expand. Prepare a brief presentation or written report to explain your vision of what e-commerce will look like in 2030.

4. Prepare a brief report or presentation on how businesses are using Instagram or another social network of your choosing as a social e-commerce platform.

5. Follow up on events at Uber since July 2022 (when the end-of-chapter case study was prepared). Prepare a short report on your findings.

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CHAPTER 2

E-commerce Business Models and Concepts

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

2.1 Identify the key components of e-commerce business models.
2.2 Describe the major B2C business models.
2.3 Describe the major B2B business models.
2.4 Understand key business concepts and strategies applicable to e-commerce.

NEW Video Cases

See **eText Chapter 2** to watch these videos and complete activities:

2.1 NFT Startup Magic Eden

2.2 Venture Capital Firm Neo

Connected Cars:

The Next Big E-commerce Platform?

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Get ready! In the not-too-distant future, your car is likely to become a major platform for e-commerce. You will be able to browse the Web, shop, and consume online content, all from the comfort of your vehicle. Beyond that are many new services only dimly recognized now but technically feasible. What will make this all possible is a confluence of forces and interests. Major players include automobile manufacturers, Big Tech companies, telecommunications companies, and financial services companies, who are all seeking to leverage the Internet of Things (IoT), 5G cellular service, artificial intelligence and voice assistant software, autonomous self-driving cars, and other related technology developments to both extend and create new markets for their services.

Today, most new cars sold in the United States are already "connected cars" in the sense that they come with built-in Internet access. According to market research firm Insider Intelligence/eMarketer, about 63% of licensed drivers (around 147 million people) in the United States drive a connected vehicle, and Insider Intelligence/eMarketer expects that by 2025, that percentage will expand to more than 70%. According to McKinsey, by 2030, 95% of new vehicles sold globally will be connected. This installed base will generate an enormous amount of data, with each individual car producing more than 25 Gb of data an hour. "Smart cars" build on this connected car foundation by embedding technologies that perform driving functions such as parking assistance, collision avoidance, lane-centering steering, and adaptive cruise control. The ultimate goal is a "self-driving" vehicle: one that can operate fully autonomously. This will free up driving time for more e-commerce-related activities.

There are four basic categories of business models based on connected/smart cars: mobility services (carpooling, on-demand ride services, and vehicle sharing or renting); customer experience (infotainment/entertainment, loyalty programs, mobile payments, shopping/purchasing, concierge services, and games and other apps); car services (customized vehicle settings, predictive maintenance, and usage-based insurance); and safety/security (driver condition monitoring, video surveillance, roadside sign recognition, driver coaching,

anti-theft tracing, and emergency calling). The ability to monetize the data produced by cars is likely to become an important part of the revenue model for some of these new services, with McKinsey estimating that such services could deliver between $250 billion and $400 billion in annual incremental revenue across the connected car ecosystem by 2030.

The potential impact for e-commerce is enormous. In-vehicle payments by consumers are expected to reach more than $6.5 billion by 2026 and to top $12.5 billion by 2032. Major brands such as Mastercard and Visa are investing in linked auto payment technologies. For instance, Visa has partnered with SiriusXM to provide a SiriusXM digital wallet that allows users to pay for parking, food, and road tolls. Ford has signed a deal with online payment processor Stripe that is aimed at bolstering the auto giant's e-commerce strategy.

McKinsey predicts that by 2030, 60% to 70% of new cars sold in North America will have technology that enables preference-based personalization, allowing all car occupants to have personalized controls and their own infotainment content. For content distributors, connected cars provide a potentially huge market that will eventually provide passengers with access to the same types of media that they have when they're at home. As cars become more and more automated and as drivers are able to shift from driving to watching video content, industry analysts project that in-car entertainment revenue will skyrocket.

Marketers are already thinking about how they can use the data generated by connected cars to promote products and services as well as to leverage emerging technology, such as huge display screens, like BMW's 31-inch screen, that new cars are being equipped with to advertise directly to car owners. For example, SirusXM's Connected Vehicle Services e-commerce platform leverages customer data collected from use of its digital wallet to deliver contextual advertising through the vehicle's audio and navigation interfaces.

Tech companies such as Apple, Google, Microsoft, and Amazon also believe that smart, connected cars offer them the opportunity to extend their technology platforms and expand their influence by becoming the operating system of a car's content platform and possibly of the entire car. Apple, for example, is developing its own autonomous connected vehicle that is expected to be deeply integrated with its mobile iOS operating system. Apple's CarPlay and Google's Android Auto are already being placed into cars, providing familiar interfaces along with voice-activated Siri and Google Assistant capabilities. For instance, GM has integrated Google Assistant into select vehicles as part of a move to design its infotainment systems around the Google Automotive OS. Amazon has also entered the fray, with deals with a variety of car manufacturers to integrate its Alexa intelligent voice assistant into their vehicles. E-mail, voice-activated texting, music, videos, streaming music, and social networking can easily be deployed to consumers who already know how the software interfaces look, feel, and work. The integration of Siri, Google Assistant, and Alexa also creates additional options for in-car marketing and advertising, with many companies now attempting to optimize their online assets for voice search as well as developing voice applications for use in connected cars.

But simply providing a platform for apps is not enough. Tech companies have greater ambitions and are developing large-scale cloud platforms that combine cloud infrastructure, edge technology, AI, and IoT services that enable manufacturers to build customized solutions for infotainment, navigation, and predictive services. These platforms can also facilitate in-vehicle Internet access and leverage subscription-based services from partner companies, such as vehicle maintenance, streaming entertainment, emergency communications, in-car commerce, financial services, and energy management. Examples of such platforms are Amazon's Connected Vehicle Solution (which runs on Amazon AWS), Microsoft's Connected Vehicle Platform (Microsoft Azure), and Google's Connected Car Cloud Platform (Google Cloud).

Some car manufacturers still have their own plans for capturing this new e-commerce platform. For instance, keeping control over the data generated by their vehicles' onboard electronics is one reason Volkswagen is developing Vw.os, its own car operating system with its own online store of apps and services, for its new series of electric cars. Toyota, Daimler AG (Mercedes Benz), and GM are also in the process of developing their own operating systems.

The future of connected car e-commerce is still in flux, however. For instance, in February 2022, GM announced that it would be discontinuing its connected car Marketplace app, which allowed customers to buy coffee, pay for fuel, and make restaurant reservations directly from the dashboard screens of their cars. The app was part of GM's Connected Access subscription plan available on selected models. Critics of the app noted that it was very unwieldy to use. To buy fuel at a Shell station, for instance, customers had to first register with Shell and then receive a PIN that would need to be input at the pump to authorize the purchase, a far cry from the "frictionless" experience that most consumers desire. GM claims that it is not abandoning e-commerce efforts for connected cars and that it will likely roll out a new service in the near future, one that builds on what it has learned from the Marketplace app.

Other issues surrounding connected car services include safety, security, and privacy. In addition, many of the services offered may come with a price tag in the form of additional monthly subscriptions that some consumers will not accept. Another issue centers around what some consumers may see as being coerced into watching advertisements in order to use their car's features. But if experience is a guide, the desire to stay connected, consume content, purchase online, and socialize with friends will trump many of those concerns. The connected car is likely be a new venue for all these activities and to become the next big e-commerce platform.

SOURCES: "In Vehicle Payment Market Value to Grow by Almost US$12.6 Bn During 2022–2032," by Future Market Insights, Globenewswire.com, May 2, 2022; "In-Car Marketing: The Retail Unit of the Future?" by Cory Schroder, Latana.com, April 21, 2022; "GM Shuts Down Marketplace, the App that Let You Buy Gas and Coffee from Your Car's Screen," by Andrew Hawkins, Theverge.com, February 23, 2022; "General Motors Killing Popular Vehicle App," by Karl Furlong, Carbuzz.com, February 22, 2022; "Media Innovation Round-Up: In-Car Commerce, Avatar Evolution & Livestreaming Matures," by Marek Wrobel, Thedrum.com, February 17, 2022; "Toyota to Launch Own Operating System, Vying with Tesla, VW," by Ryo Asayama and Yuki Fukumoto, Asia.nikkei.com, January 4, 2022; "US Connected Cars Forecast 2021: Automotive Industry Lines Blur," by Jessica Lis, Insider Intelligence/eMarketer, October 27, 2021; "The Long Road Ahead for In-Vehicle Commerce," Smartosc.com, October 25, 2021; "V-commerce: Will in-Car Payments Be the Next Big Thing for Automotive," by Nikki Gilliand, Econsultancy.com, September 16, 2021; "Unlocking the Full Life-Cycle Value from Connected-Car Data," by Michele Bertoncello et al., Mckinsey.com, February 11, 2021; "Connected Cars 2020," by Victoria Petrock, Insider Intelligence/eMarketer, February 3, 2020; "Making Money from Connected Cars," by Richard Fouts, Medium.com, June 15, 2019; "The Battle for the Last Unconquered Screen—The One in Your Car," by Tim Higgins and William Boston, *Wall Street Journal*, April 6, 2019.

The opening case illustrates how new technologies can pave the way for the creation of new platforms for e-commerce and new business models. Desktop and laptop computers were the first technology platform enablers of e-commerce, followed by the mobile platform (smartphones and tablets). Although still in relative "infancy," smart, connected cars provide the basis for the next major e-commerce platform. But leveraging new technology is only part of the story in developing a successful e-commerce business. Businesses must also provide customers with real value, develop effective and efficient operations, avoid harmful legal and social entanglements, and produce profitable business results. In addition, successful business models must scale. The business must be able to achieve efficiencies as it grows in volume. To understand how to develop a successful e-commerce business, you must become familiar with the various components of an e-commerce business plan, the primary types of e-commerce business models, and basic business concepts and business strategies. We cover all of these topics in this chapter.

2.1 E-COMMERCE BUSINESS MODELS

INTRODUCTION

business model
a set of planned activities designed to result in a profit in a marketplace

business plan
a document that describes a firm's business model

e-commerce business model
a business model that aims to use and leverage the unique qualities of the Internet, the Web, and the mobile platform

A **business model** is a set of planned activities (sometimes referred to as business processes) designed to result in a profit in a marketplace. A business model is not always the same as a business strategy, although in some cases they are very close insofar as the business model explicitly takes into account the competitive environment (Ovans, 2015; Magretta, 2002). The business model is at the center of the business plan. A **business plan** is a document that describes a firm's business model. A business plan always takes into account the competitive environment. An **e-commerce business model** aims to use and leverage the unique qualities of the Internet, the Web, and the mobile platform.

EIGHT KEY ELEMENTS OF A BUSINESS MODEL

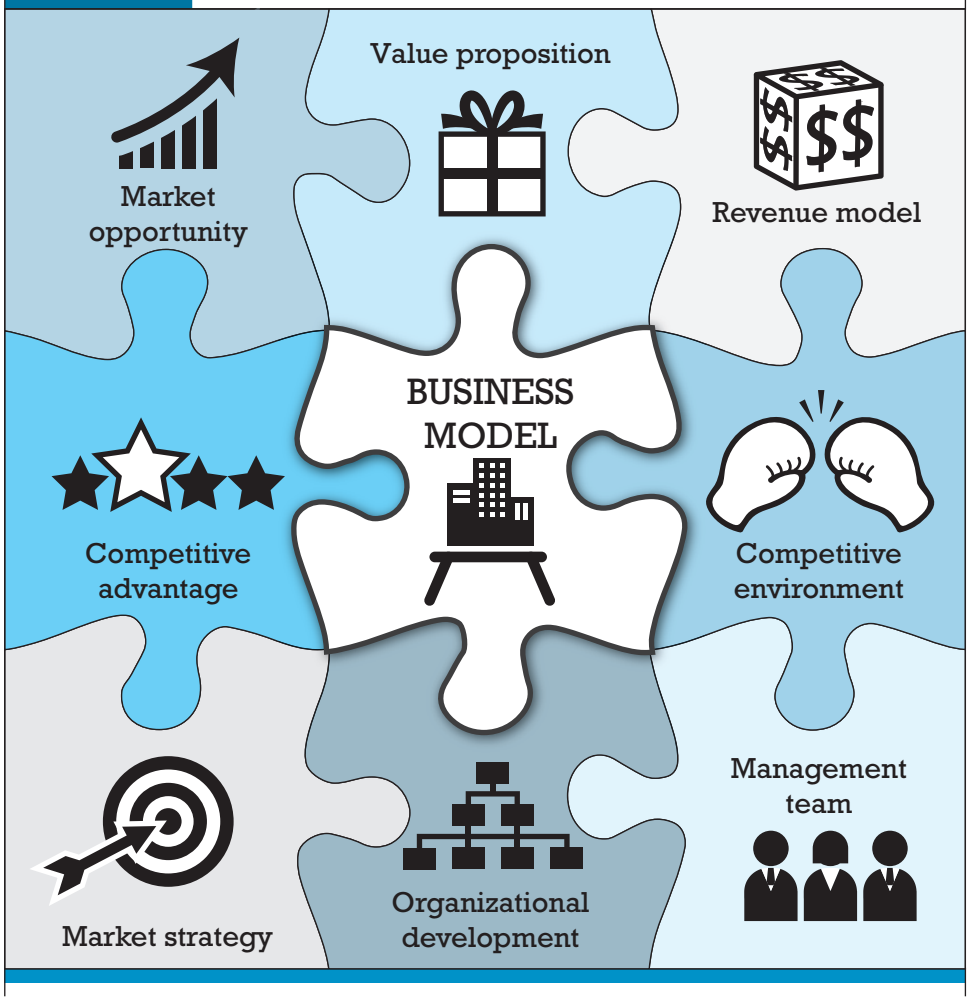
If you hope to develop a successful business model in any arena, not just e-commerce, you must make sure that the model effectively addresses the eight elements shown in **Figure 2.1**. These elements are value proposition, revenue model, market opportunity, competitive environment, competitive advantage, market strategy, organizational development, and management team. Many writers focus on a firm's value proposition and revenue model. While these may be the most important and the most easily identifiable aspects of a business model, the other elements are equally important when evaluating business models and plans, or when attempting to understand why a particular business has succeeded or failed. In the following sections, we describe each of the key business model elements more fully.

Value Proposition

value proposition
defines how a company's product or service fulfills the needs of customers

A company's value proposition is at the very heart of its business model. A **value proposition** defines how a company's product or service fulfills the needs of customers (Payne, Frow, and Eggert, 2017). To develop and/or analyze a firm's value proposition, you need to understand

FIGURE 2.1 THE EIGHT KEY ELEMENTS OF A BUSINESS MODEL



A business model has eight key elements. Each element must be addressed if you hope to be successful.

why customers will choose to do business with the firm instead of with another company and what the firm provides that other firms do not and cannot. From the consumer point of view, successful e-commerce value propositions include personalization and customization of product offerings, reduction of product search costs, reduction of price discovery costs, and facilitation of transactions by managing product delivery.

For instance, before Amazon existed, most customers personally traveled to book retailers to place an order. In some cases, the desired book might not be available, and the customer would have to wait several days or weeks for the book to become available and then return to the bookstore to pick it up. Amazon makes it possible for book lovers to shop for virtually any book from the comfort of their home or office, 24 hours a day, and to know immediately whether a book is in stock. Amazon's Kindle takes this one step further by making e-books instantly available with no shipping delay. Amazon's primary value propositions are unparalleled selection and convenience.

Revenue Model

revenue model
describes how a business will earn revenue, generate profits, and produce a superior return on invested capital

A **revenue model** describes how a business will earn revenue, generate profits, and produce a superior return on invested capital. We use the terms *revenue model* and *financial model* interchangeably. The function of business organizations is both to generate profits and to produce returns on invested capital that exceed alternative investments. Profits alone are not sufficient to make a business "successful" (Porter, 1985). To be considered successful, a firm must produce returns greater than alternative investments. Firms that fail this test go out of existence.

Although there are many different e-commerce revenue models that have been developed, most businesses rely on one, or some combination, of the following major revenue models: advertising, subscription, transaction fee, sales, and affiliate.

advertising revenue model
a business provides a forum for advertisements and receives fees from advertisers

In the **advertising revenue model**, a business that offers content, services, and/or products also provides a forum for advertisements and receives fees from advertisers. Companies that are able to attract the greatest viewership or that have a highly specialized, differentiated viewership and are able to retain user attention ("stickiness") are able to charge higher advertising rates. Yahoo, for instance, derives a significant amount of revenue from display and video advertising.

subscription revenue model
a business offers its users content or services and charges a subscription fee for access to some or all of its offerings

In the **subscription revenue model**, a business that offers content or services charges a subscription fee for access to some or all of its offerings. For instance, the digital version of *Consumer Reports* provides online and mobile access to its content (such as detailed ratings, reviews, and recommendations) only to subscribers, for a $39 annual fee. Experience with the subscription revenue model indicates that to successfully overcome the disinclination of users to pay for content, the content offered must be perceived as a high-value-added, premium offering that is not readily available elsewhere nor easily replicated. Companies successfully offering content or services online on a subscription basis include eHarmony (dating services), Ancestry (genealogy research), Microsoft's Xbox Live (video games), Pandora, Spotify, and Apple Music (music), Scribd and Amazon's Kindle Unlimited program (e-books), and Netflix and Hulu (television and movies). See **Table 2.1** for examples of various subscription services.

freemium strategy
a business gives away a certain level of product or services for free but then charges a subscription fee for premium levels of the product or service

Businesses sometimes combine a subscription revenue model with a freemium strategy. In a **freemium strategy**, a business gives away a certain level of product or services for free but then charges a subscription fee for premium levels of the product or service. For instance, both eHarmony and Spotify use a freemium strategy.

transaction fee revenue model
a business receives a fee for enabling or executing a transaction

In the **transaction fee revenue model**, a business receives a fee for enabling or executing a transaction. For example, eBay provides a marketplace platform and receives a small transaction fee from a seller if the seller is successful in selling the item. E*Trade, a financial services provider, receives transaction fees when it executes certain types of financial transactions on behalf of a customer.

sales revenue model
a business derives revenue by selling goods, content, and/or services

In the **sales revenue model**, a business derives revenue by selling goods, content, and/or services to customers. Amazon, for instance, uses a sales revenue model for all three. It sells physical products, digital content products such as eBooks and audiobooks, and services (such as Amazon Prime). A number of businesses use a subscription-based sales revenue model. Birchbox, which offers home delivery of beauty products for a $15 monthly or a $156 annual subscription cost, is

TABLE 2.1 EXAMPLES OF SUBSCRIPTION SERVICES

NAME	DESCRIPTION
eHarmony (dating)	• Free: Create profile, browse anonymously, view profiles of matches, use communication tools, limited ability to respond to messages • Premium Light (see photos, send and receive unlimited messages): $395 for 6 months • Premium Plus (same premium services as Premium Light but at a reduced rate for one year): $482
Ancestry (genealogical research)	• All U.S. records: $24.99 billed monthly or $119 for six months • All U.S. and international records: $39.99/monthly or $169 for six months
Scribd (e-books)	• Unlimited access to books and audiobooks for $11.99/month (more than 1 million e-books and audio books from which to choose)
Spotify (music)	• Free: Listen to songs, podcasts, and audiobooks; listen to select playlists on mobile; advertising-supported • Premium: Ad-free music, unlimited skips, play any song and download music from anywhere. Many different permutations, including Individual ($9.99/month), Duo (two accounts, $12.99/month), Family (six accounts, $15.99/month), and Student ($4.99/month)

one example. Dollar Shave Club, which sells razor blades by subscription and was acquired by Unilever for $1 billion, is another.

In the **affiliate revenue model**, a business that steers customers to an "affiliate" receives a referral fee or percentage of the revenue from any resulting sales. For example, MyPoints makes money by connecting companies with potential customers by offering special deals to its members. When they take advantage of an offer and make a purchase, members earn "points" that they can redeem for freebies, and MyPoints receives a fee. Community review businesses, such as TripAdvisor, Yelp, and Angi typically receive some of their revenue from steering potential customers to websites where customers make a purchase. Social media influencers who receive a commission from brands they represent can also be characterized as using an affiliate revenue model.

Table 2.2 on page 62 summarizes these major revenue models. The *Insight on Society* case, *Foursquare's Evolving Business Model: Leveraging Your Location*, examines some of the issues associated with Foursquare's business and revenue model.

affiliate revenue model
a business steers customers to an "affiliate" and receives a referral fee or percentage of the revenue from any resulting sales

market opportunity
refers to a company's intended marketspace and the potential financial opportunities available to the business in that marketspace

marketspace
the area of actual or potential commercial value in which a business intends to operate

Market Opportunity

The term **market opportunity** refers to a company's intended **marketspace** (i.e., an area of actual or potential commercial value) and the potential financial opportunities available to the business in that marketspace. The market opportunity is usually divided into smaller market niches. The realistic market opportunity is defined by the revenue potential in each of the market niches where the business hopes to compete.

INSIGHT ON SOCIETY

FOURSQUARE'S EVOLVING BUSINESS MODEL: LEVERAGING YOUR LOCATION

Foursquare, today one of the Internet's largest location data-tracking firms, began life in 2009 as a social mobile app that allowed users to check into a location, see reviews from other users, and automatically let friends on other social networks know where they were. It became a Silicon Valley darling, with expectations that it would someday be worth more than $1 billion. But as the years passed, those expectations were dashed, as other social networks such as Instagram and Snapchat leapfrogged over Foursquare in popularity. By 2013, many analysts had written Foursquare off and were predicting its demise.

In 2014, Foursquare made the decision to revamp its business model. It split its namesake app into two separate apps with different focuses. The redesigned Foursquare City Guide app became a recommender system akin to a travel guide, using passive location tracking to offer suggestions to users about where to eat or visit. A separate app, Swarm, absorbed Foursquare's check-in feature. Swarm asks the user to identify things he or she likes, known as "tastes," from more than 10,000 possibilities and then provides recommendations. At the same time, Foursquare decided to shift its primary focus from its consumer mobile apps to leveraging the vast trove of location-based data collected by those apps—by licensing that data, as well as software tools and technology, to other companies. In 2015, Foursquare launched Pinpoint, an advertising tool that allows marketers to target users based on Foursquare's accumulated, historical location data, including factors such as "taste" preferences, demographics, and visit history. Since 2015, Foursquare has continued to build on its enterprise-level offerings. In addition to Pinpoint, it offers a variety of tools, including Places, a database/API tool that enables developers to integrate location data from more than 100 million points of interest around the world into their own offerings; Placed, which measures the effectiveness of digital ad campaigns looking to drive traffic into stores; and access to its Pilgrim SDK. Pilgrim is Foursquare's core location data technology, running in the background of the Foursquare City Guide and Swarm apps. Access to this technology allows app developers to embed location awareness into their own iOS and Android apps as well as to send notifications to users whenever they are near one of the millions of points of interest in Foursquare's database.

The shift in its business model has been the key to success for Foursquare. Although its apps continue to have dedicated users (who through the years have checked in 14 billion times), more than 99% of its revenue is derived from software and data products. Today, Foursquare's clients include Amazon, Apple, Twitter, Snapchat, Uber, Spotify, AirBnb, Coca-Cola, and JetBlue as well as more than 150,000 other partners. Foursquare's location technology powers the display of name and location of venues in Uber's app, Twitter's geotags, location-based filters on Snapchat, parts of Apple Maps, and much more. Marketing clients include many of the country's major brands. In 2019, Foursquare acquired Placed to beef up its existing ad measurement tool. Placed brought an additional 6 million users, who have agreed to have their real-time locations tracked, into Foursquare's fold. In 2020, Foursquare merged with Factual, another location-data provider. Factual brings enhanced ad-targeting capabilities, boosting Foursquare's

underlying data set. In 2021, Foursquare added Unfolded, a geospatial data unification, enrichment, visualization, and analytics platform. Going forward, Foursquare sees location and geospatial technology and data as the foundational building blocks for virtually all businesses as the world becomes increasingly digitized and with the continued growth of the mobile platform, augmented and virtual reality, and IoT devices.

However, as its location-based services business has grown, so too have concerns about privacy. Foursquare's Pilgrim technology relies on automatically collecting data about the phone's GPS coordinates any time the phone is turned on, even when an app is closed. Persistent location tracking of this sort further enhances the value of Foursquare's location data. However, in April 2021, Apple released a new iOS update, 14.5, that aims to make privacy issues related to apps more visible. If an app uses an SDK, such as Foursquare's Pilgrim SDK, the developer must describe what data the SDK collects and how the data may be used. Apps must now also ask for permission before tracking a user's activity (including physical location), giving the user the option to never share their location, to share only when the app is in use, or to always share. Users can also choose to share only their approximate location instead of a specific location. Google instituted similar policies in February 2022. These changes have created challenges for Foursquare. Research from mobile tracking firm Adjust found that a significant majority (about 75%) of users have been opting out of tracking. To boost background location-sharing opt-in rates, Foursquare suggests a number of strategies. For instance, it advises developers to display their own opt-in prompt before the phone's operating system does, to show the location-enabled feature before asking for permission, and to display a series of onboarding screens to explain how data is collected and how it will be used and shared.

Foursquare insists that it is one of the "good guys" in the location data industry. Its co-founder, Dennis Crowley, argues that privacy-regarding policies are built into the DNA of the company. For instance, Foursquare points to the fact that it provides only aggregate, anonymized data to its clients. But privacy advocates question whether data can ever truly be anonymized, with research suggesting that such data can be de-anonymized with surprising accuracy. For example, one study indicated that algorithms that analyze Twitter posts in tandem with Foursquare or Instagram posts can identify users' identities with relative ease. Foursquare has attempted to characterize itself as a leader on privacy, with its former chief executive officer, Jeff Glueck, publicly calling for federal privacy legislation. Its current chief executive officer, Gary Little, says Foursquare has an obligation not to misuse its users' data and that, for instance, it does not allow flashlight apps to use its location-tracking technology because that does not provide any value to the user. Striking a balance between respecting user privacy and continuing to drive profitability will continue to be a challenge for Foursquare moving forward.

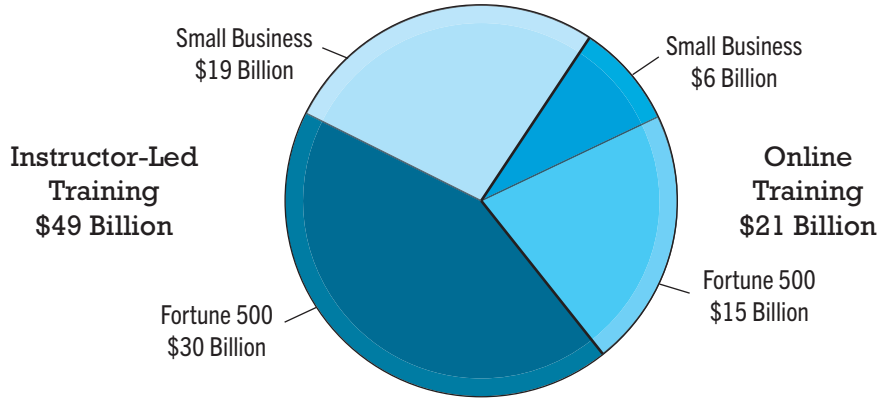
SOURCES: "Company - About," Foursquare.com, accessed September 29, 2022; "Remember Foursquare? The Location Tech Used by Apple, Uber, and Coca-Cola Knows You," by Leah Collins, Cnbc.com, June 16, 2022; "Mobile App Trends 2022," by Adjust, March 2022; "A Guide to Getting the Most Out of Pilgrim SDK," Foursquare.com, August 18, 2021; "Foursquare Invented the Check-in. Then It Watched the World Shut Down," by Issie Lapowsky, Protocol.com, June 28, 2021; "Welcome, Unfolded," by Gary Little, Foursquare.com, May 20, 2021; "Foursquare Merges with Factual, Another Location-Data Provider," by Sahil Patel, *Wall Street Journal*, April 6, 2020; "Foursquare CEO Calls on Congress to Regulate Location Data Industry," by Zach Whittaker, Techcrunch.com, October 16, 2019; "Foursquare to Buy Location-Data Specialist Placed from Snapchat Parent," by Keach Hagey and Patience Haggin, *Wall Street Journal*, May 31, 2019; "Foursquare's First Decade, from Viral Hit to Real Business and Beyond," by Harry McCracken, Fastcompany.com, March 11, 2019; "Foursquare Is Throwing in the Towel on Being a Social App, but Has Another Trick Up Its Sleeve," by Kerry Flynn, Mashable.com, August 8, 2017; "Why the Industry Needs a Gut-Check on Location Data Use," by Kate Kaye, Adage.com, April 26, 2017; "Location Data from Just Two of Your Apps Is Enough to Reveal Your Identity," by Brian Mastroianni, Cbsnews.com, April 14, 2016; "Foursquare's Plan to Use Your Data to Make Money—Even if You Aren't a User," by Klint Finley, Wired.com, January 19, 2016.

TABLE 2.2 FIVE PRIMARY REVENUE MODELS

REVENUE MODEL	EXAMPLES	REVENUE SOURCE
Advertising	Yahoo Facebook	Fees from advertisers in exchange for advertisements
Subscription	eHarmony *Consumer Reports* Online Netflix	Fees from subscribers in exchange for access to content or services
Transaction Fee	eBay E*Trade	Fees (commissions) for enabling or executing a transaction
Sales	Amazon Birchbox (subscription)	Sales of goods, information, or services
Affiliate	MyPoints	Fees for business referrals

For instance, let's assume you are analyzing a software training company that creates online software-learning systems for sale to businesses. The size of the software training market for all market segments is approximately $70 billion. The market can be broken down, however, into two major market segments: instructor-led training products, which comprise about 70% of the market ($49 billion in revenue), and online training, which accounts for 30% ($21 billion). There are further market niches within each of those major market segments, such as the *Fortune* 500 online training market and the small business online training market. Because the company is a startup, it cannot compete effectively in the large business online training market (about $15 billion). Large brand-name training firms dominate this niche. The company's real market opportunity is to sell to the thousands of small business firms that spend about $6 billion on online software training. This is the size of the firm's realistic market opportunity (see **Figure 2.2**).

FIGURE 2.2 MARKETSPACE AND MARKET OPPORTUNITY IN THE SOFTWARE TRAINING MARKET



Marketspaces are composed of many market segments. A company's realistic market opportunity will typically focus on one or a few market segments.

Competitive Environment

A firm's **competitive environment** refers to the other businesses selling similar products in the same marketspace. It also refers to the presence of substitute products and potential new entrants to the market as well as to the power of customers and suppliers over the business. (See Section 2.4 for a further discussion of the environment in which a business operates, also referred to as industry structure.) The competitive environment is influenced by several factors: how many competitors are active, how large their operations are, what the market share of each competitor is, how profitable these firms are, and how they price their products.

competitive environment refers to the other businesses selling similar products in the same marketspace, the presence of substitute products and potential new entrants, and the power of customers and suppliers over the business

Businesses typically have both direct and indirect competitors. Direct competitors are businesses that sell very similar products and services into the same market segment. For example, Priceline and Expedia, both of which sell airline tickets online, are direct competitors because the companies sell identical products. Indirect competitors are companies that may be in different industries but still compete indirectly because their products can substitute for one another. For instance, automobile manufacturers and airline companies operate in different industries, but they still compete indirectly because they offer consumers alternative means of transportation. CNN, a news outlet, is an indirect competitor of ESPN, not because they sell identical products but because they both compete for consumers' time online.

The existence of a large number of competitors in any one segment may be a sign that the market is saturated and that it may be difficult to become profitable. On the other hand, a lack of competitors could signal either an untapped market niche ripe for the picking or a market that has already been tried without success because there is no money to be made. Analysis of the competitive environment can help a business decide which it is.

Competitive Advantage

Businesses achieve a **competitive advantage** when they can produce a superior product and/or bring the product to market at a lower price than most, or all, of their competitors (Porter, 1985). Businesses also compete on scope. Some businesses can develop global markets, while others can develop only a national or a regional market. Businesses that can provide superior products at the lowest cost on a global basis are truly advantaged.

competitive advantage achieved by a business when it can produce a superior product and/or bring the product to market at a lower price than most, or all, of its competitors

Businesses achieve competitive advantages because they have somehow been able to obtain differential access to the factors of production that are denied to their competitors—at least in the short term. Perhaps the business has been able to obtain very favorable terms from suppliers, shippers, or sources of labor. Or perhaps the business has more experienced, knowledgeable, and loyal employees than any competitors. Maybe the business has a patent on a product that others cannot imitate or has access to investment capital through a network of former business colleagues or has a brand name and popular image that other businesses cannot duplicate. An **asymmetry** exists whenever one participant in a market has more resources—financial backing, knowledge, information, and/or power—than other participants. Asymmetries lead to some businesses having an edge over others, permitting the former to come to market with better products, to do so more quickly than competitors can, and sometimes offer the products at lower cost.

asymmetry exists whenever one participant in a market has more resources than other participants

For instance, when Apple announced iTunes, a service offering legal, downloadable individual song tracks for 99 cents a track that would be playable on any digital device with iTunes software, it had better-than-average odds of success because of its

prior success with innovative hardware designs and because of the large number of music industry companies that it had meticulously lined up to support its online music catalog. Few competitors could match the combination of inexpensive, legal songs and powerful hardware to play them on.

first-mover advantage
a competitive market advantage that results from being the first into a marketplace with a serviceable product or service

complementary resources
resources not directly involved in the production of the product but required for success, such as marketing, management, financial assets, and reputation

unfair competitive advantage
occurs when one develops an advantage based on a factor that other businesses cannot purchase

perfect market
a market in which there are no competitive advantages or asymmetries because all businesses have equal access to all the factors of production

leverage
when a business uses its competitive advantages to achieve more advantage in surrounding markets

market strategy
the plan a business puts together that details exactly how it intends to enter a market and attract customers

One rather unique competitive advantage derives from being a first mover. A **first-mover advantage** is a competitive market advantage that results from being the first into a marketplace with a serviceable product or service. If first movers develop a loyal following or a unique interface that is difficult to imitate, they can sustain their first-mover advantage for long periods (Varadarajan, Yadav, and Shankar, 2014). Amazon provides a good example, as does Uber. However, first movers sometimes lack the **complementary resources** (resources not directly involved in the production of the product but required for success, such as marketing, management, financial assets, and reputation) needed to sustain their advantages, and in those cases, follower firms reap larger rewards. For instance, Google was preceded in the search engine market by companies such as Excite, AltaVista, and Lycos, none of which has survived (Carpenter, 2020). Many of the success stories we discuss in this book are those of companies that were followers—businesses that gained knowledge from the failure of pioneering firms and entered into the market late.

Some competitive advantages are called "unfair." An **unfair competitive advantage** occurs when one business develops an advantage based on a factor that other businesses cannot purchase (Smagin, 2021; Barney, 1991). For instance, a brand name cannot be purchased and is in that sense an "unfair" advantage. Brands are built upon loyalty, trust, reliability, and quality. Once obtained, they are difficult to copy or imitate, and they permit businesses to charge premium prices for their products.

In **perfect markets**, there are no competitive advantages or asymmetries because all businesses have access to all the factors of production (including information and knowledge) equally. However, real markets are imperfect, and asymmetries leading to competitive advantages do exist, at least in the short term. Most competitive advantages are short term, although some can be sustained for very long periods. But not forever. In fact, many respected brands fail every year.

Businesses are said to **leverage** their competitive assets when they use their competitive advantages to achieve more advantage in surrounding markets. For instance, Amazon's move into the online grocery business leverages Amazon's huge customer database and years of e-commerce experience.

Market Strategy

No matter how tremendous a firm's qualities, its marketing strategy and execution are often just as important. The best business concept, or idea, will fail if it is not properly marketed to potential customers.

Everything a business does to promote its products and services to potential customers is known as marketing. **Market strategy** is the plan a business puts together that details exactly how it intends to enter a market and attract customers. See Chapters 6 and 7 for a further discussion of e-commerce marketing and market strategy.

Organizational Development

Although many entrepreneurial ventures are started by one visionary individual, it is rare that one person alone can grow an idea into a multi-million-dollar company.

In most cases, fast-growth companies—especially e-commerce businesses—need employees and a set of business procedures. In short, all businesses—new ones in particular—need an organization to efficiently implement their business plans and strategies. Many e-commerce businesses and many traditional businesses that attempt an e-commerce strategy have failed because they lacked the organizational structures and supportive cultural values required to support new forms of commerce.

Businesses that hope to grow and thrive need to have a plan for **organizational development** that describes how the business will organize the work that needs to be accomplished. Typically, the work is divided into functional departments, such as production, shipping, marketing, customer support, and finance. Jobs within these functional areas are defined, and then recruitment begins for specific job titles and responsibilities. Typically, in the beginning, generalists who can perform multiple tasks are hired. As the business grows, recruiting becomes more specialized. For instance, at the outset, a business may have one marketing manager. But after two or three years of steady growth, that one marketing position may be broken down into seven separate jobs done by seven individuals.

organizational development
plan that describes how a business will organize the work that needs to be accomplished

For instance, Pierre Omidyar started eBay (then known as AuctionWeb) to sell a friend's broken laser pointer, but within a few months the volume of business had far exceeded what he alone could handle. So he began hiring people with more business experience to help out. Soon the company had many employees, departments, and managers who were responsible for overseeing the various aspects of the organization.

Management Team

Arguably, the single most important element of a business model is the **management team**, the employees of the business responsible for making the business model work. A strong management team gives a business model instant credibility to outside investors, immediate market-specific knowledge, and experience in implementing business plans. A strong management team may not be able to salvage a weak business model, but the team should be able to change the model and redefine the business as doing so becomes necessary.

management team
employees of the business responsible for making the business model work

Eventually, most businesses get to the point of having several senior executives or managers. How skilled managers are, however, can be a source of competitive advantage or disadvantage. The challenge is to find people who have both the experience and the ability to apply that experience to new situations.

To be able to identify good managers for a business startup, first consider the kinds of experiences that would be helpful to a manager joining the business. What kind of technical background is desirable? What kind of supervisory experience is necessary? How many years in a particular function should be required? Do prospective senior managers have experience and contacts for raising financing from outside investors?

Table 2.3 summarizes the eight key elements of a business model and the key questions that must be answered to successfully develop each element.

RAISING CAPITAL

Raising capital is one of the most important functions for the founder of a startup business and its management team. Not having enough capital to operate effectively is a primary reason so many startup businesses fail. Many entrepreneurs initially "bootstrap"

TABLE 2.3 KEY ELEMENTS OF A BUSINESS MODEL

COMPONENTS	KEY QUESTIONS
Value proposition	Why should the customer buy from the business?
Revenue model	How will the business earn money?
Market opportunity	What marketspace does the business intend to serve, and what is its size?
Competitive environment	Who else occupies the intended marketspace?
Competitive advantage	What special advantages does the business bring to the marketspace?
Market strategy	How does the business plan to promote your its products or services to attract its target audience?
Organizational development	What types of organizational structures within the business are necessary to carry out the business plan?
Management team	What kinds of experiences and background are important for the company's leaders to have?

seed capital
typically, an entrepreneur's personal funds derived from savings, credit card advances, home equity loans, or money from family and friends

elevator pitch
short, two-to-three-minute presentation aimed at convincing investors to invest

incubators
typically provide a small amount of funding and also an array of services to startup companies

to get a business off the ground, using personal funds derived from savings, credit card advances, home equity loans, or money from family and friends. Funds of this type are often referred to as **seed capital**. Once such funds are exhausted, if the business is not generating enough revenue to cover operating costs, additional capital will be needed. Traditional sources of capital include incubators, commercial banks, angel investors, venture capital firms, and strategic partners. One of the most important aspects of raising capital is the ability to boil down the elements of the company's business plan into an **elevator pitch**, a short, two-to-three-minute (about the length of an elevator ride, giving rise to its name) presentation aimed at convincing investors to invest. **Table 2.4** lists the key elements of an elevator pitch.

Incubators (sometimes also referred to as accelerators) such as Y Combinator (profiled in Chapter 1's *Insight on Business* case) typically provide a small amount of funding,

TABLE 2.4 KEY ELEMENTS OF AN ELEVATOR PITCH

ELEMENT	DESCRIPTION
Introduction	Your name and position, your company's name, and a tagline in which you compare what your company does to what a well-known company does. Example: "My name is X, I am the founder of Y, and we are the Uber/Amazon of Z."
Background	The origin of your idea and the problem you are trying to solve.
Industry size/market opportunity	Brief facts about the (hopefully very large) size of the market.
Revenue model/numbers/growth metrics	Insight into your company's revenue model and results thus far, how quickly it is growing, and early adopters, if there are any.
Funding	The amount of funds you are seeking and what those funds will help you achieve.
Exit strategy	How your investors will achieve a return on their investment.

but, more importantly, they also provide an array of services (such as business, technical, and marketing assistance as well as introductions to other sources of capital) to the startup companies that they select to participate in their programs. Well-known incubator programs include TechStars, Dreamit Ventures, and Capital Factory.

Obtaining a loan from a commercial bank is often difficult for a startup business without much revenue, but it may be worthwhile to investigate programs offered by the U.S. Small Business Administration and its state or local equivalents. The advantage of obtaining capital in the form of a loan (debt) is that, although it must be repaid, it does not require an entrepreneur to give up any ownership of the business. **Angel investors** are typically wealthy individuals (or a group of individuals) who invest their own money in an exchange for an equity share in the stock in the business. In general, angel investors make smaller investments (typically $1 million or less) than venture capital firms, are interested in helping a business grow and succeed, and invest on relatively favorable terms compared to later-stage investors. The first round of external investment in a business is sometimes referred to as Series A financing.

angel investors
typically, wealthy individuals or a group of individuals who invest their own money in exchange for an equity share in the stock of the business; often are the first outside investors in a startup

Venture capital investors typically become more interested in a startup business once it has begun attracting a large audience and generating some revenue, even if it is not profitable. **Venture capital investors** invest funds they manage for other investors, such as investment banks, pension funds, insurance companies, or other businesses, and usually want to obtain a larger stake in the business and exercise more control over the operation of the business than angel investors typically want. Venture capital investors also typically want a well-defined "exit strategy," such as a plan for an initial public offering (IPO) or acquisition of the business by a more established business within a relatively short period of time (typically three to seven years), that will enable them to obtain an adequate return on their investment. Venture capital investment often ultimately means that the founder(s) and initial investors will no longer control the business at some point in the future.

venture capital investors
typically invest funds they manage for other investors; usually later-stage investors

Crowdfunding involves using the Internet to enable individuals to collectively contribute money to support a project. There are several different types of crowdfunding. *Donor-based crowdfunding* is epitomized by sites such as GoFundMe, where people make contributions to others with no expectation of any return. *Rewards-based crowdfunding* was popularized by Kickstarter and Indiegogo. These sites, and others like them, involve a creator looking to raise money to support a project. Backers often receive some type of reward, often corresponding to the size of their contribution to the project. The sites take a small commission, usually about 5%, on completed projects. Crowdfunding of this sort has become a mainstay in the development of movies, video games, art installations, and many other types of projects. Initially, this sort of crowdfunding was not able to be used for equity investments in for-profit companies because of U.S. securities laws and regulations. However, the passage of the Jumpstart Our Business Startups (JOBS) Act in 2012 and the issuance of regulations by the Securities and Exchange Commission ushered in *equity crowdfunding* (sometimes also referred to as *regulation crowdfunding*), which enables companies to use the Internet to solicit investors to invest in small and early stage startups in exchange for stock. At first, only wealthy, accredited investors were allowed to invest, but subsequent regulations (Regulation A + /Title IV and Regulation CF/Title III) now enable a broader group of potential investors with lower net worth and income to also participate. Currently, a company can crowdfund up to $5 million over a 12-month period. See the *Insight on Business* case, *Startups Turn to Crowdfunding*, for a further look at how startups are turning to crowdfunding to raise funds.

crowdfunding
involves using the Internet to enable individuals to collectively contribute money to support a project

INSIGHT ON BUSINESS

STARTUPS TURN TO CROWDFUNDING

In years past, startups viewed raising money through crowdfunding as a last resort. But times have changed. Today, more and more startups are turning to equity (Regulation CF) crowdfunding, for a variety of reasons. The Covid-19 pandemic played a large role in jumpstarting equity crowdfunding's rise. When the pandemic hit, it shifted many venture capital investors into a defensive position, with a significant number scaling back their funding activities, as many of the typical, face-to-face activities that venture capital firms used to assess new investments were cancelled. Equity crowdfunding became a bright spot amid the gloom, with the amount of funds raised in 2020 in the United States more than doubling from the amount raised the previous year, to about $210 million.

Then in 2021, new crowdfunding regulations enacted by the Securities and Exchange Commission (SEC) went into effect. Previously, SEC regulations enabled a company to crowdfund only up to slightly more than $1 million in any 12-month period. The new regulations allow companies to raise as much as $5 million. The regulations also removed the monetary limits on the amount accredited investors could invest. Non-accredited investors still have limits, depending on their annual income and net worth, but those limits were also increased. Another important change is that companies can now group capital raised through equity crowdfunding into a single entity, known as a special purpose vehicle, or SPV. Previously, companies were required to list each individual investor on their books. For many startups, this not only posed an administrative nightmare but also potentially could have triggered a different SEC rule that requires companies with more than a certain number of investors to register as a public company. Finally, companies can now test the waters to determine potential investor interest in an offering before having to make any regulatory filings. Another factor in the growth of equity crowdfunding is the ability to use social media as a means of free or relatively inexpensive promotion. This has all paved the way for a significant increase in equity crowdfunding investments, which in 2021 totaled more than $450 million. Analysts estimate that between 2021 and 2025, crowdfunding investments will increase at a compound annual growth rate of more than 15%.

The leading crowdfunding platforms have also shown impressive growth. For instance, startups listed on Wefunder, which claims to be the largest equity crowdfunding site by investment volume and number of investors, raised $186 million in 2021, a 33% increase from 2020. Wefunder was a major proponent of the JOBS Act, and in 2013, its founders participated in the Y Combinator program (see the *Insight on Business* case in Chapter 1 for more information on Y Combinator). Wefunder offers a platform for equity crowdfunding, Regulation A+ crowdfunding (which authorizes larger investments from more wealthy investors), and more traditional Regulation D investing (which is subject to more stringent regulation). Wefunder has been the launch pad for a number of successful companies. One example is Checkr, which offers an automated way to do background checks. Checkr raised $120,000 in initial seed funding through Wefunder in 2014, has raised $550 million since then, and is now valued at $4.6 billion. Well-known startups that have

used the Wefunder platform include Zenefits, Rappi, and Guesty. Recently, online banking startup Mercury, valued at $1.6 billion after securing $120 million from several top venture capital firms, used Wefunder to let individual investors purchase $5 million worth of shares, becoming the highest-valued company to launch an equity crowdfunding campaign. According to the company, the primary motivating factor was the desire to allow its customers to have an ownership stake in the company's growth.

StartEngine is another major platform that offers both equity and Regulation A+ crowdfunding. StartEngine regularly vies with Wefunder for the title of top equity crowdfunding platform. StartEngine was co-founded by Howard Marks, a co-founder of video game giant Activision, and also features the participation of Kevin O'Leary, a well-known investor featured on ABC's *Shark Tank*. StartEngine helped startups raise $136 million in 2021. According to StartEngine, companies have used its platform to raise more than $600 million, and the platform has more than 950,000 prospective investors. Other major equity crowdfunding platforms include Republic, Seedinvest, Netcapital, Crowdfunder, AngelList, and Fundable. All told, there are about 70 registered crowdfunding platforms, many of them focused on a specific niche.

One of the original goals of equity crowdfunding was to help democratize access to funding. The hope has been that equity crowdfunding can work to create greater diversity among investors as well as founders and leadership teams. For instance, female founders have long been underrepresented in venture capital funding. In 2021, less than 2% of such funding went to female-founded companies. In comparison, of the funds invested in startups through equity crowdfunding, female founders received almost 20%. On one funding platform, Republic, nearly 30% of all investment opportunities had female founders. The websites of both Wefunder and Republic include functionality that makes it easy to find female-led startups as well as those that are founded by members of underrepresented groups. This represents a step in the right direction.

Enhancing the geographic diversity of startups is another goal of equity crowdfunding. For instance, historically, more than 75% of traditional venture capital funding has gone to companies in just three states: California, New York, and Massachusetts. In contrast, using crowdfunding platforms, companies from any location around the world can gain access to funding. While startups located in California still dominate in terms of total dollars invested, companies located in Southern states have had impressive funding growth since 2018. Wefunder points to the geographical diversity of companies funded on its platform: They come from 40 different states. Given that venture capital firms, startups, and the tech industry in general are routinely criticized for their lack of diversity, equity crowdfunding could be a positive force for change, with more and more startups using equity crowdfunding platforms and discovering the benefits of this model.

SOURCES: "Raise Capital," Startengine.com, accessed September 29, 2022; "2021 Market Intelligence Report," by Kingscrowd, Kingscrowd.com, April 3, 2022; "Where Are Female Founders Raising Capital," by Olivia Strobel, Kingscrowd.com, March 16, 2022; "More than $8 Million Went to Female Founders in 2021," by Yasmin Sharbaf, Kingscrowd.com, March 2, 2022; "Female-Founded Companies Get Shrinking Proportion of Record VC Funds in 2021," by Marie Leech, Bizjournals.com, January 18, 2022; "The Growth of Crowdfunding," by QSBS Expert, Qsbsexpert.com, January 13, 2022; "The Meteoric Rise of Equity Crowdfunding," by Krishan Arora, Forbes.com, December 20, 2021; "Raising Money through Crowdfunding Used to Be a Last Resort for Startups. Now, It's Attracting Unicorns," by Brian Rinker, News.yahoo.com, October 13, 2021; "Myth-Busting in Equity Crowdfunding," by Neil Littman, Forbes.com, October 6, 2021; "Equity Crowdfunding Platforms Are Booming—Exponential Series," by Antoine Tardiff, Securities.io, September 25, 2021; "How the Coronavirus May Cripple Venture Capital but Could be a Boon for Equity Crowdfunding," by Michael Burtov, Crowdfundinsider.com, April 22, 2020; "Crowdfunding Evolves from Source of Capital to a Test Market for Start-ups," by Rachel Layne, Usatoday.com, May 1, 2018.

CATEGORIZING E-COMMERCE BUSINESS MODELS: SOME DIFFICULTIES

There are many e-commerce business models, and more are being invented every day. The number of such models is limited only by the human imagination, and our list of different business models is certainly not exhaustive. However, despite the abundance of potential models, it is possible to identify the major generic types (and subtle variations) of business models that have been developed for the e-commerce arena and describe their key features. It is important to realize, however, that there is no one, correct way to categorize these business models.

Our approach is to categorize business models according to the different major e-commerce sectors—B2C and B2B—in which they operate. You will note, however, that fundamentally similar business models may appear in more than one sector. For example, the business models of online retailers (sometimes called e-tailers) and e-distributors are quite similar. However, they are distinguished by the market focus of the sector in which they are used. In the case of e-tailers in the B2C sector, the business model focuses on sales to the individual consumer, while in the case of the e-distributor, the business model focuses on sales to another business. Many companies use a variety of different business models as they attempt to extend into as many areas of e-commerce as possible. We look at B2C business models in Section 2.2 and B2B business models in Section 2.3.

A business's technology platform is sometimes confused with its business model. For instance, "mobile e-commerce (m-commerce)" refers to the use of mobile devices and cellular and wide area networks to support a variety of business models. Commentators sometimes confuse matters by referring to m-commerce as a distinct business model, which it is not. All of the basic business models we discuss can be implemented on both the traditional, desktop/laptop platform and the mobile platform. Smart speakers such as Amazon's Echo and Google's Home lines provide a third platform. Connected TVs and connected cars (see the opening case) are also likely to become platforms in the not-too-distant future. Likewise, social e-commerce and local e-commerce are not business models in and of themselves but, rather, are subsectors of B2C and B2B e-commerce in which different business models can operate.

You will also note that some companies use multiple business models. For instance, Amazon has multiple business models: It is an e-tailer, content provider, market creator, e-commerce infrastructure provider, and more. Firms often seek out multiple business models as a way to leverage their brands, infrastructure investments, and assets developed with one business model into new business models.

Finally, no discussion of e-commerce business models would be complete without mention of a group of companies whose business model is focused on providing the infrastructure necessary for e-commerce companies to exist, grow, and prosper. These are the e-commerce enablers. They provide the hardware, operating system software, networks and communications technology, applications software, web design, consulting services, and other tools required for e-commerce (see **Table 2.5**). While these firms may not be conducting e-commerce per se (although in many instances, e-commerce in its traditional sense is in fact one of their sales channels), as a group they have perhaps profited the most from the development of e-commerce. We discuss many of these players in the following chapters.

TABLE 2.5 E-COMMERCE ENABLERS

INFRASTRUCTURE	PLAYERS
Hardware: Web Servers	HP • Dell • Lenovo
Software: Web Server Software	Microsoft • IBM/Red Hat • Oracle
Cloud Providers	Amazon Web Services • Microsoft Azure • IBM Cloud • Google Cloud
Hosting Services	Liquid Web • Hostinger • 1&1 Ionos • HostGator • Bluehost
Domain Name Registration	GoDaddy • Network Solutions • Dotster
Content Delivery Networks	Akamai • Fastly • Amazon CloudFront • Cloudflare
Site Design	Wix • Weebly • Squarespace • Jimdo
Small/Medium Enterprise E-commerce Platforms	Shopify • BigCommerce • YoKart
Enterprise E-commerce/M-commerce Platforms	Adobe • IBM • Oracle • Salesforce • SAP • Intershop
M-commerce Hardware Platforms	Apple • Samsung • LG
Streaming, Rich Media, Online Video	Adobe • Apple • Syndigo
Security and Encryption	VeriSign • Check Point • GeoTrust • Entrust • Thawte
Payment Systems	PayPal • Authorize.net • Square • Cybersource
Web Performance Management	Neustar • SmartBear • Dynatrace • SolarWinds
Comparison Engine Feeds/Marketplace Management	ChannelAdvisor • CommerceHub • Tinuiti
Customer Relationship Management	Oracle • SAP • Salesforce • Microsoft Dynamics 365
Order Management	Blue Yonder • Stone Edge • Monsoon
Fulfillment	Blue Yonder • ShipBob • CommerceHub
Social Marketing	Buffer • HootSuite • SocialFlow
Search Engine Marketing	iProspect • ChannelAdvisor • Merkle
E-mail Marketing	Constant Contact • Cheetah Digital • Klaviyo • Mailchimp
Affiliate Marketing	CJ • Rakuten Affiliate Network
Customer Reviews and Forums	Bazaarvoice • PowerReviews • BizRate
Live Chat/Click-to-Call	LivePerson • Genesys DX • Oracle
Web Analytics	Google Analytics • Adobe Analytics • Webtrends

2.2 MAJOR BUSINESS-TO-CONSUMER (B2C) BUSINESS MODELS

Business-to-consumer (B2C) e-commerce, in which online businesses seek to reach individual consumers, is the most well-known and familiar type of e-commerce. **Table 2.6** identifies the major business models utilized in the B2C arena.

online retailer (e-tailer)
a business that enables customers to shop and purchase via a website and/or mobile app

ONLINE RETAILER (E-TAILER)

An **online retailer** (sometimes also called an **e-tailer**) is a business that enables customers to shop and purchase via a website and/or mobile app. In the early years of

TABLE 2.6 B2C BUSINESS MODELS

BUSINESS MODEL	VARIATIONS	EXAMPLES	DESCRIPTION	REVENUE MODELS
Online retailer (E-tailer)	Virtual Merchant	Amazon Wayfair Bluefly	Online version of retail store, where customers can shop and purchase goods	Sales of goods
	Omnichannel merchant	Walmart Target	Online distribution channel for a company that also has physical stores	Sales of goods
	Manufacturer-Direct (D2C/DTC)	Dell Nike Everlane	Manufacturer uses online channel to sell direct to customer	Sales of goods
Community Provider		Facebook Instagram TikTok Twitter Pinterest LinkedIn	Sites and apps that enable individuals to come together and "meet" online	Advertising, subscription, affiliate referral fees
Content Provider	Traditional	*Wall Street Journal* Netflix Apple Music	Offers customers newspapers, magazines, books, films, television, music, games, and other forms of online content	Advertising, subscription fees, sales of digital goods
	Creators	MrBeast (YouTube) Charli D'Amelio (TikTok) Karen X Cheng (Instagram) Tim Dillon (Patreon)	Offers users original forms of online content, most often videos or podcasts, but also other types of content, typically posted on platforms such as YouTube, TikTok, Instagram, and Patreon	Advertising, subscription fees, affiliate referral fees, sales of digital goods
Portal	Horizontal/ General	Yahoo AOL MSN	Offers an integrated package of content, search, and social network services: news, e-mail, chat, music downloads, video streaming, calendars, etc. Seeks to be a user's home base	Advertising, subscription fees, transaction fees
	Vertical/ Specialized (Vortal)	Sailnet	Focuses on a particular subject matter or market segment	Advertising, subscription fees, transaction fees
	Search	Google Bing	Focuses primarily on offering search services; typically, also offers additional content	Advertising, affiliate referral
Transaction Broker		E*Trade Expedia	Processors of online transactions, such as stockbrokers and travel agents, that increase customers' productivity by helping them get things done more quickly and more cheaply	Transaction fees
Market Creator		eBay Etsy Uber Airbnb	Businesses that use Internet technology to create markets that bring buyers and sellers together	Transaction fees
Service Provider		Envoy Wave RocketLawyer	Companies that make money by selling users a service rather than a product	Sales of services

e-commerce, most e-tailers were purely virtual, without a physical presence, and many continue to operate in that manner. Today, however, they have been joined by traditional retailers, many of which now engage in "omnichannel" retail, selling via websites and mobile apps as well as physical stores. E-tailers come in all sizes, from giant Amazon to niche websites that sell only a few products. Several other variations of e-tailers—such as manufacturer-direct (sometimes also referred to as direct-to-consumer [D2C or DTC])—also exist.

The market opportunity for e-tailers is very large and is even more so in the wake of the Covid-19 pandemic. However, the sector is extremely competitive. Because **barriers to entry** (the total cost of entering a new marketplace) in online retail are low, tens of thousands of small e-tailers have sprung up. Becoming profitable and surviving are very difficult, however, for e-tailers with no prior brand name or experience. The e-tailer's challenge is differentiating its business from that of existing competitors.

barriers to entry the total cost of entering a new marketplace

Companies that try to reach every online consumer are likely to deplete their resources quickly. Those that develop a niche strategy, clearly identifying their target market and its needs, are best prepared to make a profit. Keeping expenses low, selection broad (within a specific niche), and inventory controlled are keys to success in e-tailing, with inventory being the most difficult to gauge. Online retail is covered in more depth in Chapter 9.

COMMUNITY PROVIDER

A **community provider** creates an online environment where people can "meet" online to connect and communicate; share interests, photos, and videos; and, increasingly, transact (buy and sell goods and services) without the limitations of geography and time to hinder participation. Examples include Facebook, Instagram, TikTok, Twitter, Pinterest, LinkedIn, and hundreds of other smaller, niche online communities and social networks.

community provider creates an online environment where people can "meet" online to connect and communicate; share interests, photos, and videos; and, increasingly, transact (buy and sell goods and services)

The basic value proposition of community providers is to create a fast, convenient, one-stop platform where users can communicate and share information, photos, and videos with family, friends, and others that they have connected with online. Community providers typically rely on a hybrid revenue model that includes advertising fees from other businesses, subscription fees, transaction fees, sales revenues, and affiliate fees.

Two of the oldest online communities are The Well, which provides a forum for technology and Internet-related discussions, and The Motley Fool, which provides financial advice, news, and opinions. The Well is supported by a membership plan that costs $15 a month or $150 a year. The Motley Fool supports itself through ads and a freemium subscription model.

Participation in online communities is one of the most popular online activities. Both the very large social networks, such as Facebook, Instagram, TikTok, Twitter, Pinterest, and LinkedIn, as well as niche social networks with smaller, dedicated audiences, are ideal marketing and advertising territories. Focused online communities such as The Motley Fool find that the breadth and depth of knowledge offered are important

factors, as are moderators that help keep discussions on course and relevant. Community members frequently request knowledge, guidance, and advice.

Online communities benefit significantly from offline word-of-mouth, viral marketing. Online communities tend to reflect offline relationships: When your friends say they have a profile on Instagram, you are encouraged to build your own online profile to be able to "follow" them. We discuss online communities and social networks further in Chapter 11.

CONTENT PROVIDER

content provider distributes digital content, such as news, information, music, photos, and video

A **content provider** distributes digital content, such as news, information, music, photos, and video. Content providers can make money via a variety of different revenue models, including advertising, subscription fees, and sales of digital goods. For instance, in the case of Apple Music, a monthly subscription fee provides users with access to millions of music tracks. Other content providers, such as *Harvard Business Review* charge customers for content downloads in addition to, or in place of, a subscription fee. Of course, not all online content providers charge for their information. Many content providers, such as ESPN and CNN, enable users to access content without charge, although sometimes they may be required to register as a member. These online content providers make money in other ways, such as through advertising and partner promotions. Increasingly, however, "free content" may be limited to only certain content, whereas premium content—in-depth articles or videos—requires a fee, typically in the form of a subscription.

Generally, the key to becoming a successful content provider is owning the content. Traditional owners of copyrighted content—publishers of books and newspapers, broadcasters of radio and television programs, music publishers, and movie studios—have an advantage over newcomers who simply offer distribution channels and must pay for content, often at very high prices.

Any startup that intends to make money by providing content is likely to face difficulties unless it has a unique information source that others cannot access. For the most part, this category is dominated by traditional content providers. However, over the last several years, user-generated content—in the form of video, podcasts, newsletters, literary content, online classes, digital art, and more (typically supported by advertising, subscription, or other fees from the user's audience)—has come to occupy an ever-increasing role in the online content landscape. People who develop and distribute such content are now typically referred to as "creators," a label originated by YouTube in 2011 for a growing class of users who were attracting large audiences to their channels. From there, the label spread. Influencers, who use social media to grow a following and exert influence over those followers (typically for some form of compensation or monetization), can be considered a subset of creators, although some use the terms synonomously (see Chapters 6 and 7 for more information about influencer marketing). More than 200 million people characterize themselves as creators, and an entire ecosystem, referred to as the creator economy, has spread up around them. The creator economy includes businesses, such as platforms for their content like YouTube, Patreon, TikTok, Instagram, Substack, Gumroad, Twitch, and many others, that support creators and enable them to earn revenue; content creation tools; monetization tools; fan interaction and community management tools; ad platforms;

and administrative tools. It's difficult to truly pinpoint how much the sector is worth, but some estimate it to be around $20 billion and growing rapidly (CB Insights, 2021; Chayka, 2021; Lowry, 2022).

Online content is discussed in further depth in Chapter 10.

PORTAL

Portals such as Yahoo, MSN, and AOL offer users search tools as well as an integrated package of content and services, such as news, e-mail, shopping, music, video streaming, and more, all in one place. Initially, portals sought to be viewed as "gateways" to the Internet. Today, however, the portal business model is to be a destination: places where consumers will stay to read news, find entertainment, and view other types of content. Portals generate revenue primarily by charging advertisers for ad placement, collecting referral fees for steering customers to other sites, and charging for premium services.

portal
offers users search tools as well as an integrated package of content and services all in one place

Yahoo, AOL, and MSN are horizontal portals because they define their marketspace to include all users of the Internet. Vertical portals (sometimes called vortals) attempt to provide similar services as horizontal portals but are focused on a particular subject matter or market segment. For instance, Sailnet focuses on the world's sailing community and provides sailing news, articles, discussion groups, free e-mail, and a retail store. Although the total number of a vortal's users may be relatively small, if the market segment is attractive enough, advertisers will be willing to pay a premium to reach a targeted audience. Google can also be considered a portal of a sort but focuses primarily on offering search and advertising services. Google generates revenues primarily from advertising and also from affiliate referral fees. We discuss portals further in Chapter 11.

TRANSACTION BROKER

A **transaction broker** provides online processing for transactions that were previously normally handled in person, by phone, or by mail. The primary industries using this model are financial services and travel services. The online transaction broker's primary value propositions are savings of money and time. In addition, most transaction brokers also provide relevant content.

transaction broker
provides online processing for transactions that were previously handled in person, by phone, or by mail

While millions of customers have shifted to online financial services, fears of privacy invasion and the loss of control over personal financial information have contributed to market resistance. Some are also wary about switching from their traditional broker, who provides personal advice. Consequently, one of the challenges for online brokers is to overcome consumer fears by emphasizing the security and privacy measures in place, and, like physical banks and brokerage firms, by providing a broad range of financial services—and not just stock trading. This industry is covered in greater depth in Chapter 9.

Transaction brokers make money each time a transaction occurs. Stock trades, for example, net the company a fee, based on either a flat rate or a sliding scale related to the size of the transaction. Attracting new customers and encouraging them to trade are the keys to generating more revenue for these companies. Online travel companies generate commissions from travel bookings.

MARKET CREATOR

market creator builds a digital environment (market) in which buyers and sellers can meet, display and search for products and services, establish prices for products, and transact

A **market creator** builds a digital environment (market) in which buyers and sellers can meet, display and search for products and services, and establish prices. Prior to the Internet and the Web, market creators relied on physical places to establish a market. Beginning with the medieval marketplace and extending to today's New York Stock Exchange, a market has meant a physical space for transacting business. There were few private digital marketplaces prior to the Web. The Web changed this by making it possible to separate markets from physical spaces. Market creators make money by either charging a percentage of every transaction made or charging merchants for access to the market.

eBay, the online auction platform utilized by both businesses and consumers, is a prime example. eBay's business model is to create a digital environment for buyers and sellers to meet, agree on a price, and transact. This is different from transaction brokers, who actually carry out the transaction for their customers, acting as agents in larger markets. At eBay, the buyers and sellers are their own agents eBay acts simply as an intermediary. Each sale on eBay nets the company a commission based on a percentage of the item's sales price, in addition to a listing fee.

The market opportunity for market creators is potentially vast, but only if the business has the financial resources and marketing plan to attract sufficient sellers and buyers to the marketplace. As of the end of March 2022, eBay had around 142 million active buyers, 17 million sellers, and around 1.6 billion items listed on any given day within thousands of different categories (eBay Inc., 2022). Many other digital auctions have sprung up in smaller, more specialized vertical market segments such as jewelry and automobiles.

Uber, Airbnb, and Lyft are other examples of the market creator business model (although they can also be categorized as service providers). On-demand service companies are market creators that have developed online platforms that allow people to sell services, such as transportation or spare rooms, in a marketplace that operates in the cloud and relies on the Web or smartphone apps to conduct transactions. It is important to note that, although sometimes referred to as sharing economy or mesh economy companies, these companies do not in fact share resources. Users of these services are either selling something or buying something, and the companies produce revenue by extracting fees for each transaction. However, they do unlock the economic value in spare resources (personal cars and rooms) that might otherwise have been lost. In the process they have created huge online markets. For instance, Uber currently operates in more than 10,000 cities in 72 countries. Airbnb operates in more than 220 countries and 100,000 cities, has 6 million active listings, and has had more than 1 billion people use its services.

Etsy is another example of an online marketplace, one that focuses on the sales of handmade goods and crafts. The *Insight on Technology* case, *Behind the Scenes at Etsy*, explores how Etsy transformed from a barebones website into an e-commerce marketplace powerhouse.

INSIGHT ON TECHNOLOGY

BEHIND THE SCENES AT ETSY

In 2005, two NYU college students, Rob Kalin and Chris Maguire, were doing freelance web development work to help pay their tuition. They did a revamp of an online community chat forum site dedicated to crafting. In the process, they had a chance to engage with site members and learned that many of them wished they had a better place to sell the goods they were making. Trying to sell through physical venues, such as craft fairs and consignment shops, was inefficient. Most also felt that eBay was too big, too expensive, and too impersonal. Kalin and Maguire banded together with another friend, Haim Schoppik, and developed a prototype: a bare-bones e-commerce website dedicated to handmade crafts. As the prototype neared completed, Kalin began to focus on a name. He knew that a short website name would be easier to remember and also wanted a made-up word that they could build a brand around. The team settled on Etsy. At the same time, Kalin was making the rounds looking for seed funding, ultimately securing around $315,000 from three investors.

After three months of working on the site, Etsy launched in June 2005. The team prioritized going live as soon as possible with what is known as a minimum viable product, or MVP, and then adding functionality and features afterward. The site was initially free, enabling crafters to put up listings and sell their products without charge, because Etsy did not yet have a billing system. Search tools were also very rudimentary at first. But crafters signed on and began to use the site, and momentum started to build.

Behind the scenes, the Etsy team continued to work feverishly on fixing problems and adding features. For instance, it quickly became clear that more robust search functionality would be required. One of the first tools added was the ability to search items by color, something that proved so useful that Etsy ended up patenting the technology. Chat forums were another tool that sellers wanted. A geolocator was added so that shoppers could view goods from a particular country or city. Finally, after several months, Etsy implemented a transaction fee revenue model, initially charging 10 cents per listing and a 3.5% fee on items sold. By then, Etsy was gaining traction and was able to secure its first round of venture capital financing in November 2006, with follow-on rounds in 2007. By July 2007, 1 million items had been sold on the platform. But it was clear that Etsy still needed additional funds if it was going to continue to grow. In January 2008, it received an additional $27 million in venture capital investment, and subsequent rounds of funding raised the total to $97.3 million. In 2015, Etsy went public, raising $267 million and valuing the company at more than $3 billion. By that time, it had more than 54 million members, including 1.4 million active sellers, and was generating more than $1.9 billion in gross merchandise sales (GMS) on its platform.

Over the years, Etsy's technology infrastructure has also evolved. When Etsy first launched, it relied on a single web server and database. In the early years, it would take weeks to write code to fix bugs or launch new features. Almost every deployment caused website downtime. However, in 2009, Etsy started making slow but significant changes to its web development approach. It adopted DevOps (a software development methodology discussed more extensively in Chapter 4) and implemented a continuous integration/continuous delivery system that enables it to integrate new code

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frequently throughout the day without disrupting operations. Today, the platform enables millions of sellers and buyers to smoothly transact across borders, languages, and devices.

For years, Etsy had hosted its services in its own data centers, but in 2018, it began shifting to Google's Cloud Platform. Doing so has enabled Etsy to adjust to changes in traffic volume much more easily. Shifting to the cloud has also enhanced Etsy's overall infrastructure by providing faster processing speed, improved page load time, and more nimble technology on an as-needed basis.

Etsy's marketplace relies on the collection of large volumes of data, which it uses to enhance the performance of the platform and test website features. Highlighting the right product for the right buyer at the right time from the more than 120 million products listed on the website is a major challenge. Etsy uses proprietary artificial intelligence and machine learning technologies to personalize searches and recommendations and to help buyers browse, filter, and find the items they want more easily. Search results and recommendations are adjusted based on transaction data and previous browsing history. In 2021, Esty launched a proprietary capability called XWalk that uses more than 4 billion data points to capture semantic meaning and improve conversion rate by showing more relevant inventory to buyers.

Etsy is now a global platform, with more than 40% of its GMS generated from buyers and/or sellers located outside the United States. Etsy uses machine translation technology to translate listings, reviews, ads, and conversations between buyers and sellers to enable them to interact even when they do not speak the same language. Etsy has also invested in localization to create a more localized experience for buyers and sellers within their own countries.

The mobile platform has also become an increasingly important part of both Etsy's business model and its technological infrastructure. Almost two-thirds of its GMS originates from purchases on mobile devices. Esty's mobile website and mobile app include search and discovery, curation, personalization, augmented reality, and social shopping features. In 2021, downloads of its mobile app increased by almost 50%, and the mobile app has the highest conversion rate among its various channels.

Although the Esty of today has grown into a giant, with more than 95 million active buyers in nearly every country of the world and 7.7 million active sellers, it continues to share much of its DNA with the Etsy that debuted in 2005. Its stated mission is to "Keep Commerce Human," which it says is rooted in its belief that although automation and commoditization are parts of modern life, human creativity cannot be automated, and human connection cannot be commoditized. Etsy's ongoing challenges are to continue to hold fast to that mission statement while at the same time to employ the technological infrastructure required to support millions of buyers and sellers and also to satisfy the demands of its investors for revenues and profits.

SOURCES: "Etsy Inc. Form 10-Q for the Quarterly Period Ended March 31, 2022," Sec.gov, May 5, 2022; "How to Build an Online Marketplace Like Etsy: Features and Cost Estimate," Codica.com, May 5, 2022; "The History of Etsy: How Did Etsy Start," Highincomeresource.com, April 19, 2022; "How an Etsy Founder Turned Ice Cream Maker Feels about the E-commerce Marketplaces Appeal to Buyers and Sellers Alike," by Stuart Lauchlan, Diginomica.com, February 25, 2022; "Esty DevOps Case Study: The Secret to 50 Plus Deploys a Day," by Hiren Dhaduk, Simform.com, February 23, 2022.

SERVICE PROVIDER

While e-tailers sell products online, **service providers** offer services online. Service providers use a variety of revenue models. Some charge a fee, or offer subscriptions, while others generate revenue from other sources, such as through advertising. Many service providers employ a freemium revenue model in which some basic services are free but other services require the payment of additional charges. Service providers trade knowledge, expertise, and capabilities for revenue.

service provider
offers services online

Obviously, some services cannot be provided online. For example, dentistry, plumbing, and car repair cannot be completed via the Internet. However, online arrangements can be made for these services. Online service providers may offer computer services such as data storage (Dropbox and Carbonite), provide legal services (RocketLawyer), or offer accounting or bookkeeping services (Wave, Bench). To complicate matters a bit, most financial transaction brokers (described previously) also provide services such as financial planning services. Travel brokers also provide vacation-planning services, not just transactions with airlines and hotels. Indeed, mixing services with products is a powerful business strategy.

The basic value proposition of service providers is that they offer consumers valuable, convenient, time-saving, and low-cost alternatives to traditional service providers or provide services that are truly unique. The market opportunity for service providers is as large as the variety of services that can be provided and potentially is much larger than the market opportunity for physical goods. We live in a service-based economy and society; witness the growth of fast-food restaurants, package delivery services, and cellular phone services. Consumers' increasing demand for convenience products and services bodes well for current and future online service providers.

The marketing of service providers must allay consumer fears about hiring a vendor online, as well as build confidence and familiarity among current and potential customers. Building confidence and trust is as critical for service providers as it is for retail product merchants.

2.3 MAJOR BUSINESS-TO-BUSINESS (B2B) BUSINESS MODELS

Business-to-business (B2B) e-commerce, in which businesses sell to other businesses, is expected to generate about $8.5 trillion in revenues in 2022, almost seven times the size of B2C e-commerce, even though most of the public attention has focused on B2C. **Table 2.7** lists the major business models utilized in the B2B arena.

E-DISTRIBUTOR

An **e-distributor** is a company that provides an online catalog of products from many different manufacturers that are available for purchase by individual businesses. W. W. Grainger, for example, is the largest distributor of maintenance, repair, and

e-distributor
a company that provides an online catalog of products from different manufacturers that are available for purchase by individual businesses

TABLE 2.7 B2B BUSINESS MODELS

BUSINESS MODEL	EXAMPLES	DESCRIPTION	REVENUE MODEL
(1) B2B E-COMMERCE MARKETPLACE			
E-distributor	Grainger Amazon Business	Single-firm online version of retail and wholesale store; supplies maintenance, repair, operations (MRO) goods	Sales of goods
E-procurement	Ariba Network Proactis	Single firm creating digital markets where sellers and buyers transact for indirect inputs	Fees for market-making services, supply chain management, and fulfillment services
Exchange	Go2Paper MaterialsXchange	Independently owned vertical digital marketplace for direct inputs	Fees and commissions on transactions
Industry Consortium	Supply On The Seam	Industry-owned vertical digital market open to select suppliers	Fees and commissions on transactions
(2) PRIVATE B2B NETWORK			
	Walmart Procter & Gamble	Company-owned network that coordinates supply chains with a limited set of partners	Cost absorbed by network owner and recovered through production and distribution efficiencies

operations (MRO) supplies. In the past, Grainger relied on catalog sales and physical distribution centers. Its catalog of equipment went online in 1995, and in 2022, around 60% of Grainger's more than $13 billion in sales derive from its e-commerce platform, which includes websites and mobile apps (Demery, 2022).

E-distributors are owned by one company seeking to serve many customers. However, critical mass is a factor. The more products a company makes available, the more attractive the company is to potential customers. One-stop shopping is always preferable to having to visit numerous sites to locate a particular part or product.

e-procurement company
a company that helps businesses automate their procurement process (the range of activities involved in obtaining goods and services)

E-PROCUREMENT

An **e-procurement company** helps businesses automate their procurement process (the range of activities involved in obtaining goods and services). Companies such as Ariba, for instance, have created software that helps large firms organize their

procurement process by creating mini-digital markets for a single firm. Ariba creates custom-integrated online catalogs (where supplier firms can list their offerings) for purchasing firms. On the sell side, Ariba helps vendors sell to large purchasers by providing software to handle catalog creation, shipping, insurance, and finance. Both the buy and the sell side software is referred to generically as "value chain management" software.

In the software world, firms such as Ariba are sometimes also called software as a service (SaaS) or platform as a service (PaaS) providers; they are able to offer firms much lower costs of software by achieving scale economies. **Scale economies** are efficiencies that result from increasing the size of a business, for instance, when large, fixed-cost production systems (such as factories) can be operated at full capacity with no idle time. In the case of software, a firm such as Ariba benefits from scale economies by developing software and then selling it to a wide range of customers, because the marginal cost of producing additional copies of a software program is nearly zero. This is also more efficient than having each firm build its own software systems.

scale economies
efficiencies that arise from increasing the size of a business

EXCHANGES

An **exchange** is an independent digital marketplace that connects hundreds to potentially thousands of suppliers and buyers in a dynamic, real-time environment. Exchanges, which have a business model very similar to that of a B2C market creator, are typically owned by independent firms whose business is making a market, and they generate revenue by charging a commission or fee based on the size of the transactions conducted among trading parties. They usually serve a single vertical industry and focus on the exchange of direct inputs to production and short-term contracts or spot purchasing. For buyers, B2B exchanges make it possible to gather information, check out suppliers, collect prices, and keep up to date on the latest happenings all in one place. Sellers, on the other hand, benefit from expanded access to buyers. The greater the number of buyers, the higher the chances of making a sale. The ease, speed, and volume of transactions are summarily referred to as *market liquidity*.

exchange
an independent digital marketplace that connects hundreds to potentially thousands of suppliers and buyers

Exchanges make it significantly less expensive and time-consuming to identify potential suppliers and customers and for them to do business with one another. As a result, they can lower transaction costs—the cost of making a sale or purchase. Exchanges can also lower product costs and inventory-carrying costs.

INDUSTRY CONSORTIA

Industry consortia are industry-owned *vertical marketplaces* that serve specific industries. Vertical marketplaces supply companies with products and services of specific interest to their industry, while *horizontal marketplaces* supply companies in different industries with a particular type of product and service, such as marketing-related, financial, or computing services. For example, SupplyOn, founded by industrial giants Bosch (one of the world's largest suppliers of automotive components), Continental (a leading automotive manufacturing company), and Schaeffler (a global manufacturer of various types of bearings), among others, provides a shared supply chain collaboration platform for companies in various manufacturing industries. In 2022, in addition to

industry consortia
industry-owned vertical marketplaces that serve specific industries

its shareholders, its customers include Airbus, BMW, BorgWarner, Siemens, Thales, and many other major global manufacturing companies.

PRIVATE B2B NETWORKS

private B2B network a digital network designed to coordinate the flow of communications and supply chains among firms engaged in business together

A **private B2B network** is a digital network designed to coordinate the flow of communications and supply chains among firms engaged in business together. The network is owned by a single large purchasing firm. Participation is by invitation only to trusted, long-term suppliers of direct inputs. These networks typically evolve out of a firm's own enterprise resource planning (ERP) system and are an effort to include key suppliers in the firm's own business decision making. For instance, Walmart operates one of the largest private B2B networks in the world for its suppliers.

We discuss the nuances of B2B e-commerce in more detail in Chapter 12.

2.4 HOW E-COMMERCE CHANGES BUSINESS: STRATEGY, STRUCTURE, AND PROCESS

Now that you have been introduced to the variety of business models used by e-commerce businesses, you also need to understand how e-commerce has changed the business environment, including industry structures, business strategies, and industry and business operations (business processes and value chains), over the last few decades. We return to these concepts throughout the book. The Internet is an open standards system available to all players, and this fact inherently makes it easy for new competitors to enter the marketplace and offer substitute products or channels of delivery. The Internet tends to intensify competition. Because information is more readily available, the Internet inherently shifts power to buyers, who now can discover the lowest-cost provider much more easily than in the past. The Internet also provides many opportunities for creating value, for branding products and charging premium prices, and for enlarging an already powerful offline physical business.

Recall Table 1.2 in Chapter 1, which describes the unique features of e-commerce technology. **Table 2.8** suggests some of the implications of each unique feature for the overall business environment—industry structure, business strategies, and operations.

INDUSTRY STRUCTURE

industry structure refers to the nature of the players in an industry and their relative bargaining power

E-commerce changes industry structure. **Industry structure** refers to the nature of the players in an industry and their relative bargaining power. An industry's structure is characterized by five forces: *rivalry among existing competitors*, the *threat of substitute products, barriers to entry into the industry*, the *bargaining power of suppliers*, and the *bargaining power of buyers* (Porter, 1985). E-commerce has the potential to change the relative strength of these competitive forces (see **Figure 2.3**) on page 84. (View the Figure 2.3 video in the eText for an animated and more detailed discussion of this figure.)

TABLE 2.8 EIGHT UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY

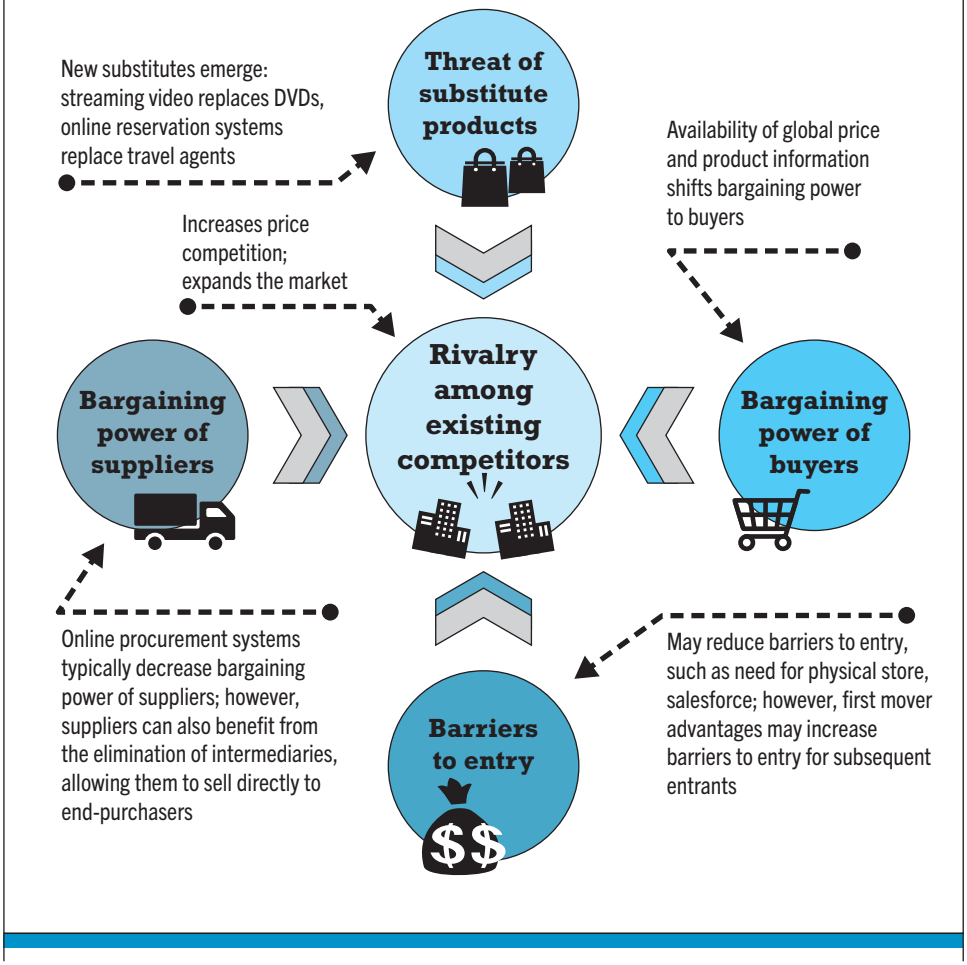
FEATURE	SELECTED IMPACTS ON BUSINESS ENVIRONMENT
Ubiquity	Alters industry structure by creating new marketing channels and expanding size of overall market. Creates new efficiencies in industry operations and lowers costs of firms' sales operations. Enables new differentiation strategies.
Global reach	Changes industry structure by lowering barriers to entry but greatly expands market at the same time. Lowers cost of industry and firm operations through production and sales efficiencies. Enables competition on a global scale.
Universal standards	Changes industry structure by lowering barriers to entry and intensifying competition within an industry. Lowers costs of industry and firm operations by lowering computing and communications costs. Enables broad scope strategies.
Richness	Alters industry structure by reducing strength of powerful distribution channels. Changes industry and firm operation costs by reducing reliance on sales forces. Enhances post-sales support strategies.
Interactivity	Alters industry structure by reducing threat of substitutes through enhanced customization. Reduces industry and firm operation costs by reducing reliance on sales forces. Enables differentiation strategies.
Information density	Changes industry structure by weakening powerful sales channels, shifting bargaining power to consumers. Reduces industry and firm operation costs by lowering costs of obtaining, processing, and distributing information about suppliers and consumers.
Personalization/ Customization	Alters industry structure by reducing threats of substitutes, raising barriers to entry. Reduces value chain costs in industry and firms by lessening reliance on sales forces. Enables personalized marketing strategies.
Social technologies	Changes industry structure by shifting programming and editorial decisions to consumers. Creates substitute entertainment products. Energizes a large group of new suppliers.

When you consider a business model, you should always perform an industry structural analysis. An **industry structural analysis** is an effort to understand and describe the nature of competition in an industry, the nature of substitute products, the barriers to entry, and the relative strength of consumers and suppliers.

industry structural analysis an effort to understand and describe the nature of competition in an industry, the nature of substitute products, the barriers to entry, and the relative strength of consumers and suppliers

E-commerce can affect the structure and dynamics of industries in very different ways. Consider the recorded music industry, an industry that has experienced significant change because of e-commerce. Historically, the major record companies owned the exclusive rights to the recorded music of various artists. With the entrance into the marketplace during the early days of e-commerce of substitute providers such as Napster and Kazaa, millions of consumers began to use the Internet to bypass traditional music labels and their distributors entirely. In the travel industry, entirely new intermediaries, such as Travelocity entered the market to compete with traditional

FIGURE 2.3 HOW E-COMMERCE INFLUENCES INDUSTRY STRUCTURE



E-commerce has many impacts on industry structure and competitive conditions. From the perspective of a single firm, these changes can have negative or positive implications depending on the situation. In some cases, an entire industry can be disrupted, while at the same time, a new industry is born. Individual firms can either prosper or be devastated.

travel agents. After Travelocity, Expedia, and other online travel services demonstrated the power of e-commerce, the major airlines banded together to form their own online marketplace, Orbitz (although ultimately selling the company to a private investor group). Clearly, e-commerce creates *new industry dynamics* that can best be described as the give and take of the marketplace, the changing fortunes of competitors.

Yet, in other industries, e-commerce has strengthened existing players. In the chemical and automobile industries, e-commerce is being used effectively by manufacturers to strengthen their traditional distributors. In these industries, e-commerce technology has not fundamentally altered the competitive forces within the industry. Hence,

each industry is different, and you need to examine each one carefully to understand the impacts of e-commerce on competition and strategy.

New forms of distribution created by new market entrants can completely change the competitive forces in an industry. For instance, consumers gladly substituted free access to Wikipedia for a $699 set of World Book encyclopedias, radically changing the competitive forces in the encyclopedia industry. As we describe in Chapter 10, the content industries have been transformed by the emergence of new distribution platforms.

Inter-firm rivalry (competition) is one area of the business environment where e-commerce technologies have had an impact on most industries. In general, e-commerce has increased price competition in nearly all markets. It has been relatively easy for existing businesses to adopt e-commerce technology and attempt to use it to achieve competitive advantage vis-à-vis rivals. For instance, e-commerce inherently changes the scope of competition from local and regional to national and global. Because consumers have access to global price information, e-commerce produces pressures on businesses to compete by lowering prices (and lowering profits). On the other hand, e-commerce has made it possible for some businesses to differentiate their products or services from others' products or services. Amazon patented one-click purchasing, for instance, while eBay created a unique, easy-to-use interface and a differentiating brand name. Therefore, although e-commerce has increased the emphasis on price competition, it has also enabled businesses to create new strategies for differentiation and branding so that they can retain higher prices.

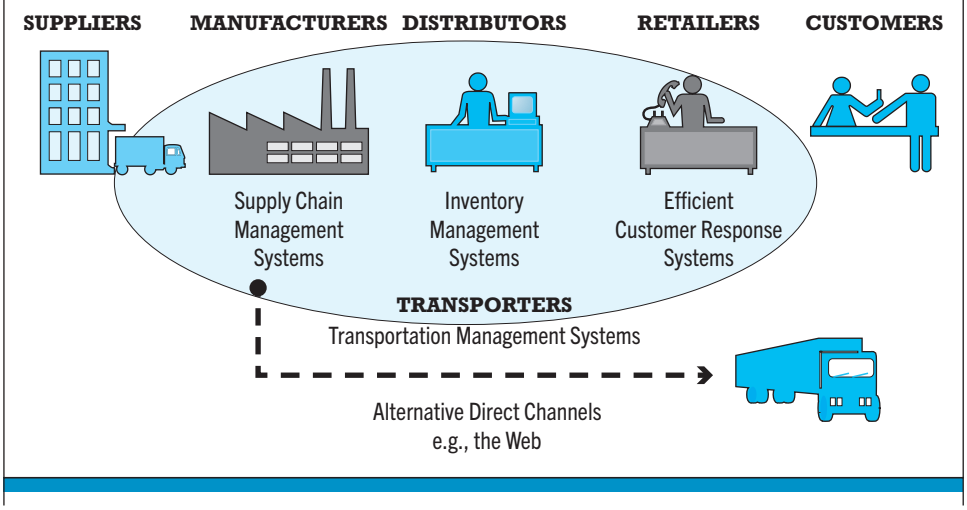
It is impossible to determine if e-commerce technologies have had an overall positive or negative impact on firm profitability in general. Each industry is unique, so it is necessary to perform a separate analysis for each one. Clearly, e-commerce has shaken the foundations of some industries, in particular content industries (such as the music, newspaper, book, and software industries) as well as other information-intense industries such as financial services. In these industries, the power of consumers has grown relative to that of providers, prices have fallen, and overall profitability has been challenged. In other industries, especially manufacturing, e-commerce has not greatly changed relationships with buyers but has changed relationships with suppliers. Increasingly, manufacturing firms are participating in industry exchanges or marketplaces in order to obtain better prices from suppliers. Throughout this book, we document changes in industry structure and market dynamics introduced by e-commerce.

INDUSTRY VALUE CHAIN

While an industry structural analysis helps you understand the impact of e-commerce technology on the overall business environment in an industry, a more detailed industry value chain analysis can help identify more precisely just how e-commerce may change business operations at the industry level. A **value chain** is the set of activities performed in an industry or in a firm that transforms raw inputs into final products and services. Each of these activities adds economic value to the final product; hence, the term *value chain* as an interconnected set of value-adding activities. **Figure 2.4** illustrates the six generic

value chain
the set of activities performed in an industry or in a firm that transforms raw inputs into final products and services

FIGURE 2.4 E-COMMERCE AND INDUSTRY VALUE CHAINS



Every industry can be characterized by a set of value-adding activities performed by a variety of actors. E-commerce potentially affects the capabilities of each player as well as the overall operational efficiency of the industry.

players in an industry value chain: suppliers, manufacturers, transporters, distributors, retailers, and customers.

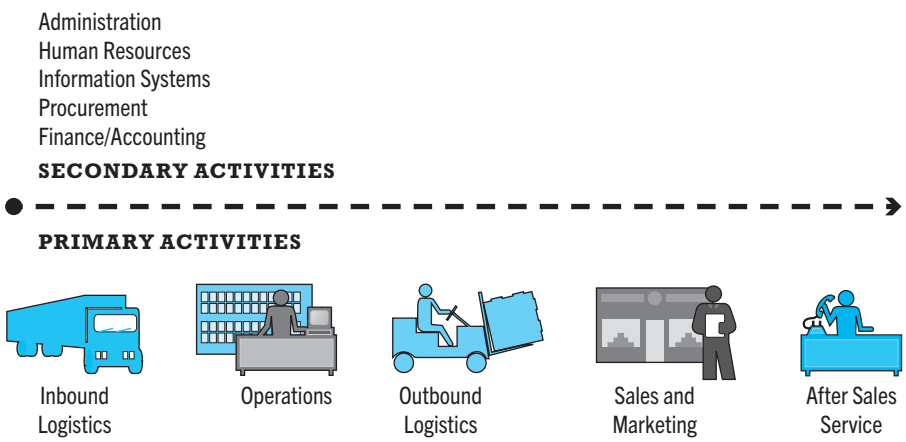
By reducing the cost of information, e-commerce offers each of the key players in an industry value chain new opportunities to maximize their positions by lowering costs and/or raising prices. For instance, manufacturers can reduce the costs they pay for goods by developing Internet-based B2B exchanges with their suppliers. Manufacturers can develop direct relationships with their customers, bypassing the costs of distributors and retailers. Distributors can develop highly efficient inventory management systems to reduce their costs, and retailers can develop highly efficient customer relationship management systems to strengthen their service to customers. Customers in turn can search for the best quality, the fastest delivery, and the lowest prices, thereby lowering their transaction costs and reducing the prices they pay for final goods. Finally, the operational efficiency of the entire industry can increase, thus lowering prices, adding value for consumers, and helping the industry compete with alternative industries.

FIRM VALUE CHAINS

firm value chain
the set of activities a firm engages in to create final products from raw inputs

The concept of value chains can be used to analyze a single firm's operational efficiency as well. The question here is: How does e-commerce technology potentially affect the value chains of firms within an industry? A **firm value chain** is the set of activities a firm engages in to create final products from raw inputs. Each step in the process of production adds value to the final product. In addition, firms develop secondary activities that coordinate the production process and contribute to overall

FIGURE 2.5 E-COMMERCE AND FIRM VALUE CHAINS



Every firm can be characterized by a set of value-adding primary and secondary activities performed by a variety of actors in the firm. A simple firm value chain performs five primary value-adding steps: inbound logistics, operations, outbound logistics, sales and marketing, and after-sales service.

operational efficiency. **Figure 2.5** illustrates the key steps and support activities in a firm's value chain.

E-commerce offers firms many opportunities to increase their operational efficiency and differentiate their products. For instance, firms can use the Internet's communications tools to outsource some activities to specialized, more efficient providers without such outsourcing being visible to the consumer. In addition, firms can use e-commerce to coordinate the steps in the value chains more precisely and reduce their costs. Finally, firms can use e-commerce to provide users with more differentiated and high-value products. For instance, Amazon provides consumers with a much larger inventory of products to choose from, at a lower cost, than physical retail stores. It also provides many services—such as instantly available consumer reviews and information on buying patterns of other consumers—that physical retail stores cannot.

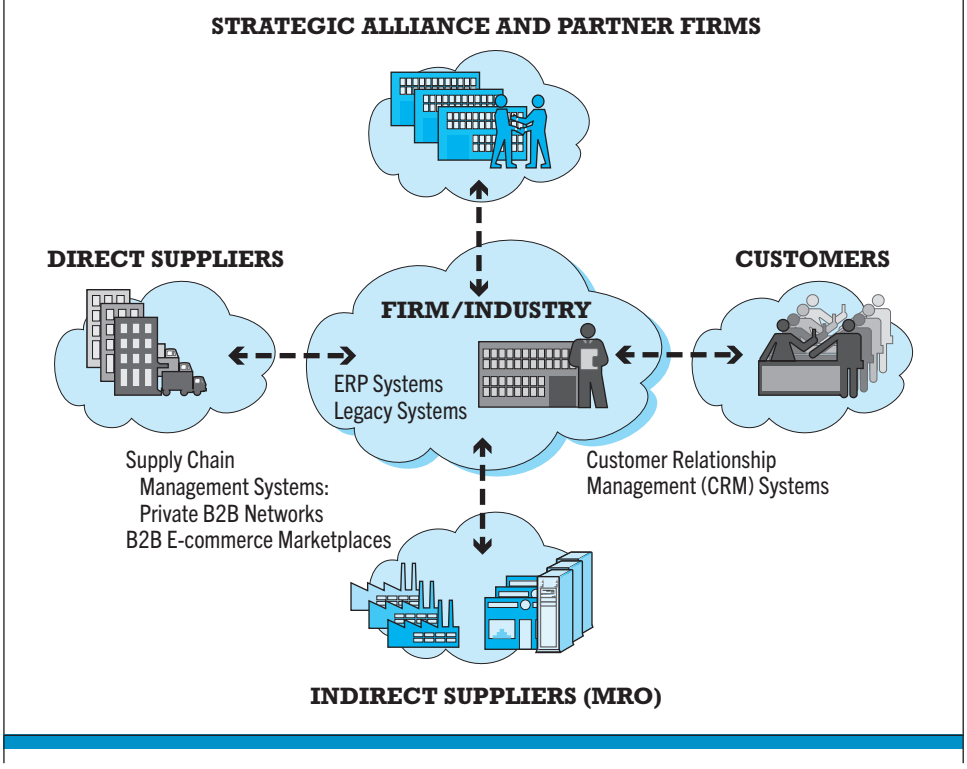
FIRM VALUE WEBS

While firms produce value through their value chains, they also rely on the value chains of their partners—their suppliers, distributors, and delivery firms. E-commerce creates new opportunities for firms to cooperate and create a value web. A **value web** is a networked business ecosystem that uses e-commerce technology to coordinate the value chains of business partners. **Figure 2.6** illustrates a value web.

value web
networked business ecosystem that coordinates the value chains of business partners

A value web coordinates a firm's suppliers with the firm's production needs using an Internet-based supply chain management system. We discuss these B2B systems in Chapter 12. Firms also use the Internet to develop close relationships with their logistics

FIGURE 2.6 INTERNET-ENABLED VALUE WEB



Internet technology enables firms to create an enhanced value web in cooperation with their strategic alliance and partner firms, customers, and direct and indirect suppliers.

partners. For instance, although Amazon now delivers the majority of packages itself, it also still relies on UPS and the U.S. Postal Service. Amazon also has alliances with hundreds of other firms for a variety of services. In fact, when you examine Amazon closely, you realize that the value it delivers to customers is in large part the result of coordination with other firms. The value of Amazon is, in large part, the value delivered by its value web partners.

business strategy
a set of plans for achieving superior long-term returns on the capital invested in a business

profit
the difference between the price a business is able to charge for its products and the cost of producing and distributing goods

BUSINESS STRATEGY

A **business strategy** is a set of plans for achieving superior long-term returns on the capital invested in a business. A business strategy is therefore a plan for making profits in a competitive environment over the long term. **Profit** is simply the difference between the price a business is able to charge for its products and the cost of producing and distributing goods. Profit represents economic value. Economic value is created anytime customers are willing to pay more for a product than it costs to produce. Why would anyone pay more for a product than it costs to produce? There are multiple answers. The product may be unique (there are no other suppliers), it may be the least costly product of its type available, consumers may be able to purchase the product anywhere in the world, or it

may satisfy some unique needs that other products do not. Each of these sources of economic value defines a business's strategy for positioning its products in the marketplace. The specific strategies that a business follows will depend on the product, the industry, and the marketplace where competition is encountered.

Although the Internet is a unique marketplace, the same principles of strategy and business apply. As you will see throughout the book, successful e-commerce strategies involve using the Internet and mobile platform to leverage and strengthen existing business (rather than destroy your business) and to provide products and services your competitors cannot copy (in the short term anyway). That means developing unique products, proprietary content, distinguishing processes (such as Amazon's one-click shopping), and personalized or customized services and products (Porter, 2001). There are five generic business strategies: product/service differentiation, cost competition, scope, focus, and customer intimacy. Let's examine these ideas more closely.

differentiation refers to the ways producers can make their products or services unique and different to distinguish them from those of competitors

commoditization a situation where there are no differences among products or services, and the only basis of choosing is price

Differentiation refers to the ways producers can make their products or services unique and distinguish them from those of competitors. The opposite of differentiation is **commoditization**—a situation where there are no differences among products or services, and the only basis of choosing is price. As economists tell us, when price alone becomes the basis of competition and there are many suppliers and many customers, eventually the price of the good/service falls to the cost to produce it (marginal revenues from the nth unit equal marginal costs). And then profits are zero! This is an unacceptable situation for any businessperson. The solution is to differentiate your product or service and to create a monopoly-like situation where you are the only supplier.

There are many ways businesses differentiate their products or services. A business may start with a core generic product or service but then create expectations among users about the "experience" of consuming the product or using the service—"Nothing equals the experience of driving a BMW." Businesses may also augment products and services by adding features to make them different from those of competitors. And businesses can differentiate their products and services further by enhancing their abilities to solve related consumer problems. The purpose of marketing is to create these differentiation features and to make the consumer aware of the unique qualities of products and services, creating in the process a "brand" that stands for these features. We discuss marketing and branding in Chapters 6 and 7.

In their totality, the differentiation features of a product or service constitute the customer value proposition we described in earlier sections of this chapter. E-commerce offers some unique ways to differentiate products and services, such as the ability to personalize the shopping experience and to customize the product or service to the particular demands of each consumer. E-commerce businesses can also differentiate products and services by making it possible to purchase the product from home, work, or on the road (ubiquity); by making it possible to purchase anywhere in the world (global reach); by creating unique interactive content, videos, stories about users, and reviews by users (richness and interactivity); and by storing and processing information for consumers of the product or service, such as warranty information on all products purchased or income tax information online (information density).

strategy of cost competition
offering products and services at a lower cost than competitors

Adopting a **strategy of cost competition** means a business has discovered some unique set of business processes or resources that other businesses cannot obtain in the marketplace. Business processes are the atomic units of the value chain. For instance, the set of value-creating activities called Inbound Logistics in Figure 2.5 is in reality composed of many different collections of activities performed by people on the loading docks and in the warehouses. These different collections of activities are called *business processes*—the set of steps or procedures required to perform the various elements of the value chain.

When a business discovers a new, more efficient set of business processes, it can obtain a cost advantage over competitors. Then it can attract customers by charging a lower price while still making a handsome profit. Eventually, its competitors go out of business as the market decisively tilts toward the lowest-cost provider. Or, when a business discovers a unique resource, or lower-cost supplier, it can also compete effectively on cost. For instance, switching production to low-wage-cost areas of the world is one way to lower costs.

Competing on cost can be a short-lived affair and very tricky. Competitors can also discover the same or different efficiencies in production. And competitors can also move production to low-cost areas of the world. Also, competitors may decide to lose money for a period as they compete on cost.

E-commerce offers some ways to compete on cost, at least in the short term. Businesses can leverage ubiquity by lowering the costs of order entry (the customer fills out all the forms, so there is no order entry department); leverage global reach and universal standards by having a single order entry system worldwide; and leverage richness, interactivity, and personalization by creating customer profiles online and treating each individual consumer differently—without the use of an expensive sales force that performed these functions in the past. Finally, businesses can leverage information intensity by providing consumers with detailed information on products, without maintaining either expensive catalogs or a sales force.

While e-commerce offers powerful capabilities for intensifying cost competition, which makes cost competition appear to be a viable strategy, the danger is that competitors have access to the same technology. The *factor markets*—where producers buy supplies—are open to all. Assuming they have the skills and organizational will to use the technology, competitors can buy many of the same cost-reducing techniques in the marketplace. Even a skilled labor force can be purchased, ultimately. However, self-knowledge, proprietary tacit knowledge (knowledge that is not published or codified), and a loyal, skilled workforce are in the short term difficult to purchase in factor markets. Therefore, cost competition remains a viable strategy.

scope strategy
competing in all markets around the globe, rather than just local, regional, or national markets

focus/market niche strategy
competing within a narrow market or product segment

Two other generic business strategies are scope and focus. A **scope strategy** is a strategy to compete in all markets around the globe, rather than merely in local, regional, or national markets. The Internet's global reach, universal standards, and ubiquity can certainly be leveraged to assist businesses in becoming global competitors. eBay, for instance, along with many of the other top e-commerce companies, has readily attained a global presence. A **focus/market niche strategy** is a strategy to compete within a narrow market segment or product segment. This is a specialization strategy with the goal of becoming the premier provider in a narrow market. For instance, Dick's Sporting

Goods uses e-commerce to continue its historic focus on sports equipment and apparel; and W. W. Grainger focuses on the narrow MRO market segment. E-commerce offers some obvious capabilities that enable a focus strategy. Businesses can leverage richness and interactivity to create highly focused messages for different market segments; information intensity makes it possible to focus e-mail and other marketing campaigns on small market segments; personalization—and related customization—means the same product can be personalized and customized to fulfill the very focused needs of specific market segments and consumers.

Another generic strategy is **customer intimacy**, which focuses on developing strong ties with customers. Strong linkages with customers increase switching costs (the costs of switching from one product or service to a competing product or service) and thereby enhance a firm's competitive advantage. For example, Amazon's one-click shopping, which retains customer details and recommendation services based on previous purchases, makes it more likely that customers will return to make subsequent purchases.

customer intimacy focuses on developing strong ties with customers in order to increase switching costs

Table 2.9 summarizes the five basic business strategies.

Industry structure, industry and firm value chains, value webs, and business strategy are central business concepts used throughout this book to analyze the viability of and prospects for e-commerce companies. In particular, the case studies found at the end of each chapter are followed by questions that may ask you to identify the competitive forces in the case or analyze how the case illustrates changes in industry structure, industry and firm value chains, and business strategy.

E-COMMERCE TECHNOLOGY AND BUSINESS MODEL DISRUPTION

While e-commerce has changed most industries in terms of their structure, processes, and strategies, in some cases e-commerce has radically changed entire industries, driving incumbent firms out of business, greatly altering the economics of an industry,

TABLE 2.9 BUSINESS STRATEGIES

STRATEGY	DESCRIPTION	EXAMPLE
Differentiation	Making products and services unique and different in order to distinguish them from those of competitors	Warby Parker (vintage-inspired prescription eyeglasses)
Cost competition	Offering products and services at a lower cost than competitors	Walmart
Scope	Competing in all markets around the globe, rather than merely in local, regional, or national markets	Apple iDevices
Focus/market niche	Competing within a narrow market or product segment	Bonobos (men's clothing)
Customer intimacy	Developing strong ties with customers	Amazon; Netflix

disruptive technologies
technologies that underpin a business model disruption

digital disruption
a business model disruption that is driven by changes in information technology

and spawning entirely new businesses and value chains (Schumpeter, 1942). When new technologies are at the core of a change in the way business is done, they are referred to as **disruptive technologies**. When the technology involved is digital, the term **digital disruption** is used. Usually, it is not the technology per se that is disruptive—in fact, it can be rather ordinary and commonplace. Instead, the disruption occurs when an innovative business applies the technology to pursue a different business model and strategy than existing businesses pursue, perhaps discovering a whole new market that existing businesses did not even know existed (Johnson, Christensen, and Kagermann, 2008; Christensen, 1997; Bower and Christensen, 1995). For instance, personal computers using off-the-shelf, inexpensive processors and technologies disrupted the market for mainframe and minicomputers. All eight elements of a business model identified previously can be affected by disruptive technologies, from the business value proposition to the revenue model, market opportunity, competitive environment, competitive advantage, market strategy, organizational development, and management. In short, it's a whole new world that often confuses and surprises successful companies, who tend to ignore, dismiss, and/or mock the early disruptive products. For instance, the entrepreneurs who introduced personal computers identified an entirely new market of customers that had been ignored by the large computer firms, along with new price points, competitive factors, and market strategy, using new organizational management teams and employees with different skills. Many existing businesses could not compete and dissolved. Similar dynamics can be found in communications (disrupted by e-mail), data storage, music, photography, publishing, and transportation (Lepore, 2014). For instance, on-demand-services businesses such as Uber and Airbnb have had a significant impact on the taxi and lodging industries.

Not all technologies are disruptive (Christensen et al., 2015; King and Baatartogtokh, 2015). In fact, most successful companies use technology to sustain their current business models, industry structure, processes, and strategies. This use of technology is referred to as **sustaining technology** because it helps companies cope with competitive pressures, improve their products, and serve their customers with less expensive, more powerful, or unique products. But the same technology can be used by innovative entrepreneurs (**disruptors**) to destroy existing business models.

sustaining technologies
technologies that enable the incremental improvement of products and services

disruptors
the entrepreneurs and firms that lead a business model disruption

Here's how it works. Successful companies use whatever technology is available to incrementally improve their products, focusing on the customer by improving quality, price, and service. The incumbent and dominant businesses seek to maintain the status quo in an industry and in their businesses. In the first disruptive stage, disruptors, often funded by new sources of finance, introduce new products that are less expensive, less capable, and of poorer quality. The first personal computers used relatively unsophisticated technology compared to that of mainframe computers of the 1970s. These early products nevertheless find a niche in a market that incumbents do not serve or are unaware of. In the second stage, disruptors improve their products at a rapid pace, taking advantage of newer technologies at a faster pace than incumbents, expanding their niche market and eventually attracting a large customer base from the incumbents' market. When word processors, and eventually Microsoft Office, were married to the more powerful PC of the 1980s, they attracted a new market of business managers and professionals that was not served by incumbents. The concept was entirely new at the time. The successful incumbents never thought that business professionals, let alone people working at home, would like to have a computer

at their desk to create documents, build spreadsheets, and make presentation slides. The people and companies that developed personal computers were outsiders to the mainframe computer industry. They were disruptors. They had the vision.

In the third stage, the new products and business model become good enough and even superior to products offered by incumbents. In the fourth stage, incumbent companies lose market share and either go out of business or are consolidated into other, more successful firms that serve a much more limited customer base. Some incumbents survive by finding new customers for their existing product, adopting some of the newer products and business models in separate divisions of their firms, or moving into other, often nearby markets. For instance, mainframe computers are still made by IBM, but they are one of the few survivors. They survived by sustaining innovation in their traditional market of large-scale computing for *Fortune* 500 firms, moving into computing services, data centers, enterprise software, and most recently cloud computing, business analytics, data mining, and machine learning. As for the PC industry, it has been disrupted by smartphones and tablet computers created by Apple, Google, and other firms that identified huge consumer markets that incumbent PC manufacturers did not realize even existed. They have the vision, for now, but in the future, they will face new digital disruptors that are sure to follow.

Why don't existing companies realize the changes that are coming and take steps to compete directly with the disruptors? Successful incumbents usually have enormous capital reserves, in-depth technology and intellectual skills, and access to prestigious management consulting firms. Why didn't Kodak see the transition to digital photography? Why didn't Canon realize the smartphone camera would a powerful competitor to digital cameras? Why don't firms disrupt their own business models? The answers are complex. The management team and IT staff in a firm may be trained in an *unfit fitness*, having the wrong skills for the current environment. Shareholders expect returns on investment, not destruction of a firm's historic and cherished profitable products. The existing customer base comes to expect continuous improvement in existing products—business as usual, not business disruption. These powerful practices, all of which make good business sense, prevent incumbent firms from meeting the challenges of business model disruption. It is unclear at this time if the two most innovative firms in the current e-commerce environment, Apple and Google, will prove any different from previous incumbents.

2.5 CAREERS IN E-COMMERCE

In this section, we'll examine a job posting by a company that uses both a B2C as well as a B2B e-commerce business model.

THE COMPANY

The company is a U.S. manufacturer of more than 3,500 different tools for both the do-it-yourself consumer market as well as the construction industries, where it is a leading provider. The company sells products through consumer retail outlets as well as through direct sales to industry. In 2007, the company launched its first B2C website.

The company is hoping to increase its B2C and B2B e-commerce revenues by developing a more robust web presence, including apps for mobile devices, and is in the process of expanding its digital marketing program (including social and mobile marketing).

POSITION: ASSISTANT MANAGER OF E-BUSINESS

You will work with the e-commerce team on initiatives to expand the company's e-commerce presence, including website development, mobile apps, search engine optimization, mobile marketing, social media, video, and e-mail. Other responsibilities include helping to:

- Develop an e-commerce road map and timeline to create e-commerce capabilities throughout the firm.
- Develop a B2B e-commerce presence to support the distributor network in collaboration with the sales and marketing teams.
- Develop and maintain an online and offline catalog content management system to support the consumer and distributor websites.
- Develop and maintain a search engine optimization plan.
- Develop a mobile and social marketing plan.
- Collaborate with the information technology (IT), sales, and marketing departments to ensure that IT capabilities can support the e-commerce plan and that content and branding efforts are consistent across all channels and align with the company's vision.
- Develop strategic plans and budgets for the e-commerce plan.

QUALIFICATIONS/SKILLS

- Bachelor's degree in business administration, management information systems, e-commerce, or digital marketing
- Basic knowledge of digital content management, social and mobile marketing, marketing automation, and/or web design and development
- Strong communication, content, presentation, and writing skills
- Problem-solving and critical-thinking skills
- Ability to collaborate with other members of the e-commerce team

PREPARING FOR THE INTERVIEW

When preparing for an interview, it is essential to do in-depth research on the firm and its industry. In this case, you should be familiar with the B2C and B2B tool marketplace, including major competitors. You also should be thoroughly familiar with the company's website and its social media presence on Facebook, Twitter, LinkedIn, and blogs, if any. Be prepared to discuss what you know with the interviewer at the appropriate moment. Review Section 2.1 so that you can demonstrate that you understand basic elements of a business plan, such as value propositions, different revenue

models, market opportunity, market strategy, and so on. Review Sections 2.2 and 2.3 so that you can discuss the differences between B2C and B2B business models. In this case, it appears that the firm will be using both an e-tailer business model as well as an e-distributor business model. Finally, review Section 2.4, which provides you with an excellent overview of basic business concepts, as well as business strategies, applicable to e-commerce.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. The company is launching a major effort to develop our e-commerce sales. In the past we have relied on physical retail stores and direct sales to other firms. What do you think our value proposition should be in these markets? Why should customers buy on our websites and use our apps?

You could start by talking about what makes a company like Amazon such a popular online retailer. Major factors include its product search engine, wide selection, ease of purchase, two-day shipping, reliable fulfillment, and convenient returns. Price is less important than its service and convenience. The company should focus on developing similar capabilities. The bottom line is that people will shop on the firm's websites if the websites provide a winning customer experience.

2. What kinds of services could we provide our customers that would attract them to our sites and apps?

You can suggest that many people who buy tools may not know how to use them most appropriately or effectively. One of the best ways to educate consumers is through videos, which could be delivered via an official company YouTube channel or provided on the firm's website, with links to the YouTube channel.

3. What kinds of strategic partners should we be working with to develop our online sales?

You could point out that very successful firms rarely do everything themselves. The firm should develop relationships with key providers of services such as UPS and FedEx for logistics and shipping; online payments systems like PayPal and credit card providers; technology providers to handle the supply chain and warehousing automation; and customer relationship management firms like Salesforce to maintain a close connection with customers. Firms specializing in e-mail campaigns, search engine optimization, video production, and mobile and social media marketing are also important strategic partners.

4. What kinds of opportunities should we explore in the B2B arena?

In the B2B e-commerce arena, in addition to creating a B2B-focused website, the firm could also explore selling its products via an e-disributor, such as Grainger.com. Other B2B business opportunities that may be relevant include participating in exchanges, establishing relationships with e-procurement firms, and/or seeking to become a preferred vendor as part of a private B2B network.

5. For many of our products we face stiff competition from low-cost, imported tools. What would you recommend that the firm's strategy be in overcoming this competition?

You can suggest that one way to compete on price with low-cost imports is to introduce a low-cost line of tools. Although low in price, they might have margins equal to or greater than tools made in the United States. Another strategy would be to move production to low-cost countries but maintain the same high quality. On the other hand, a differentiation strategy might be best by offering higher-quality, "professional"-level tools to consumers, relying on the existing brand strengths to sell at higher prices. The firm can choose to develop a focused strategy based solely on the U.S. market, or alternatively, to develop foreign sales and broaden the scope of competition. Which strategy, or combination of strategies, to pursue would take some careful analysis.

6. On the B2C side, do you think we should open stores on Amazon, eBay, or other large online retailers, or should we put all our efforts into developing our own branded websites?

You might point out that many manufacturers rely on both their own sites as well as on Amazon to sell to consumers and Amazon Business to sell to other businesses. Given Amazon's broad reach, it would seem a good idea to use Amazon as a platform for certain very popular tools and have links to the firm's own websites for consumers who want to see more of the company's products.

7. How do you think we can use social media to support our e-commerce initiative? Should a tools company have a social media presence?

You can suggest here that social media is an excellent platform for branding messages and consumer information. In addition to Facebook, there may be other social networks directed more specifically toward the firm's customers. Twitter should definitely be monitored routinely for customer mentions, to identify influencers to support the firm's products, and of course to obtain direct customer feedback. It would be a good idea to have a social media specialist in marketing to focus on social media marketing.

2.6 CASE STUDY

Weathering the Storm:
Twitter's Uncertain Future

Twitter, the social network originally based on 140-character text messages, emerged seemingly out of nowhere to take the world by storm. Twitter's basic idea was to marry short text messaging on cellphones with the Web and its ability to create social groups. As the years passed, Twitter expanded beyond simple text messages to article previews, photographs, videos, and animated images, by 2022, it had almost 230 million daily active users worldwide. The 5,000 tweets a day that it began with in 2006 has turned into a deluge of around 10,000 tweets per second and more than 500 million per day worldwide. Special events, such as the Super Bowl and Academy Awards, tend to generate an explosion of tweets. Some celebrities, such as pop star Justin Bieber, have millions of followers (in Bieber's case, around 114 million).

Twitter has a number of important assets, such as user attention, significant audience size (unique visitors), and its searchable database of tweets, which contain real-time audience comments, observations, and opinions. Twitter has become a significant media platform for the distribution of news. However, Twitter has also struggled to develop a profitable business model and display consistent growth, and its financial results and stock price have not matched its popularity and influence on culture and politics. Its user base remains a fraction of the size of Facebook's, TikTok's, and Instagram's.

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In April 2022, Elon Musk, the controversial founder and CEO of electric car company Tesla and space exploration company SpaceX, entered into an agreement to acquire Twitter in a deal that valued the company at $44 billion. After many stops and starts, the purchase finally took place on October 27, 2022, but the drama surrounding Musk has thrown Twitter, its investors, its advertisers, and its users into turmoil, raising serious questions about what the future will bring for Twitter.

Before delving into the current chaos surrounding Twitter, it helps to have some basic background into its business model, revenue model, and evolution. Twitter derives the lion's share of its revenue from advertising, with 90% of its 2021 revenue coming from various advertising products and with more than 95% of them displayed on a mobile device. Twitter offers advertisers a variety of options, including Promoted Ads (formerly called Promoted Tweets), Follower Ads (formerly called Promoted Accounts), and Twitter Takeover (formerly called Promoted Trends). Companies pay to have their tweets and Twitter accounts appear higher in Twitter searches or to reserve a place within Twitter's Trends section, which shows the most-discussed topics of the day. They can also pay to show video advertisements that run prior to video clips and that are embedded within tweets using a product called Twitter Amplify. Video is Twitter's fastest growing advertising segment and has grown to comprise almost two-thirds of Twitter's advertising revenue. All of Twitter's advertising products can be geo-targeted both locally and nationally.

Twitter also continues to refine its data-mining capability, recognizing that its stockpile of customer sentiment about products, services, and marketing efforts is among its most valuable assets. Acquisitions of companies such as Lucky Sort, Topsy Labs, and Gnip have helped Twitter provide better information about user behavior. Twitter licenses its user data to companies seeking to improve their understanding of customer sentiment. The company's data licensing segment accounted for about 11% of its revenues in 2021.

Twitter became a publicly traded company in 2013, with a valuation at that time of about $14 billion. The public offering was viewed as a rousing success, with the stock price jumping almost 75% on its opening day, despite the company's lack of profits. However, its share price declined significantly from its high of more than $74 in December 2013 down to an all-time low of less than $14 in 2016, well below its IPO price. Analysts expressed serious concerns about Twitter's future beyond the obvious lack of profits. Twitter's growth rates were anemic because of unusually poor user retention—60% of new users failed to return to the site the following month. Twitter also had highly unbalanced user engagement, with the top 15% of users accounting for 85% of all tweets. Advertisers also complained that Twitter's advertising products simply were too costly for the sales they generated and that dummy accounts and trolls ran the risk of ruining the Twitter user experience. Acknowledging a need for a change in direction, Chief Executive Officer Dick Costolo stepped down in 2015, replaced by co-founder Jack Dorsey.

Dorsey vowed to narrow the company's focus on its core service, with particular emphasis on breaking news. Twitter moved away from products and features that didn't do enough to enhance the basic user experience. For example, Twitter had hoped that it would become a hub of social e-commerce and rolled out a Buy Now button in 2014 that allowed users to add products to their Amazon shopping carts. However, in 2016,

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development on the service halted because of users' lukewarm response, and it was then phased out. Other services that failed to take off, such as Twitter's #Music app, were shelved, and even popular features like its Vine app for short-form video were discontinued. Instead, Twitter made changes to bolster its ability to deliver the news, including increasing the character limit for tweets from 140 characters to 280 characters and showing more promoted news content in user timelines. Twitter redesigned the Explore tab within its app to improve ease of use, added breaking news alerts, and launched dedicated content hubs for significant events that allowed users to follow events the way they might follow a person. It also redesigned its desktop site, aiming to provide a more consistent experience across both its mobile and its web platforms. Twitter also focused on improving its streaming video capability, including livestreaming, highlight video clips, and video-on-demand agreements across a number of verticals including sports, news, gaming, and entertainment.

Developing machine learning capabilities has also been an important initiative for Twitter. It established an internal research group called Cortex that focuses on improving Twitter by enabling advanced artificial technologies. Twitter purchased several artificial intelligence startups, such as Magic Pony, Aiden, and Fabula AI, to bolster this effort. Using AI techniques has enabled Twitter to adjust the way it ranks tweets in users' feeds, emphasizing relevance to individual users instead of simple chronological order. Machine learning algorithms now decide what types of push notifications to deliver to users. Twitter has also eliminated its less effective advertising formats, focusing only on those that deliver the best engagement for advertisers. Twitter is additionally focusing on techniques to promote what it calls conversational health, adjusting its algorithm to ensure that low-quality tweets are less accessible in searches and conversations and changing its API to prohibit links and content from being shared from many accounts at once, which is a common technique used by Twitter bots (dummy accounts that are used to spread misinformation). Although Twitter continues to aggressively identify and remove these accounts, more continue to pop up in their place. Twitter has also tried to improve its handling of habitual abusers and hate groups using its platform by employing machine learning technology to detect network manipulation and online disinformation. Striking a balance between allowing free speech and policing unacceptable hate speech and deliberate misinformation has continued to be a difficult challenge for Twitter.

These changes, in addition to Dorsey's restructuring of Twitter's board and layoffs of 9% of Twitter's workforce, finally jumpstarted Twitter's stagnant growth. In the fourth quarter of 2017, Twitter recorded the first profitable quarter in the company's history, and the company continued that trajectory through the fourth quarter of 2019. Then the Covid-19 pandemic hit, severely impacting Twitter. Although total revenue increased by 7%, it recorded a net loss of $1.14 billion for the year. Adding to the turmoil, an activist investor group that acquired a significant chunk of Twitter's shares sought to have Dorsey removed as chief executive officer. While a truce was reached, leaving Dorsey in place for the time being, his future remained somewhat uncertain. In 2021, Twitter tried to regroup. It introduced several new products, such as Twitter Spaces, a new way to have live audio conversations on Twitter, and Communities, a new way to easily find and connect with people who have similar interests. Twitter also jumped on the creator bandwagon and introduced Ticketed Spaces, Super Follows, and Tips, which give people the ability to pay creators using a variety of payment methods. Twitter also introduced

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Twitter Blue, its first-ever consumer subscription offering. Twitter Blue allows users to pay for exclusive features and perks. Returning to the social e-commerce efforts it had previously abandoned, it also launched a pilot program of a shopping feature called Shop Module that allows businesses to showcase their products at the top of their profiles and allows users to purchase items without having to leave Twitter.

In November 2021, Dorsey resigned. Although Twitter's revenue in 2021 increased from that of 2020, it once again recorded a loss for 2021, this time in part because of the costs of settling a shareholder class action lawsuit for around $810 million. Twitter's stock price declined.

Enter Elon Musk. At the beginning of April 2022, regulatory filings revealed that Musk had personally purchased a 9.2% stake in Twitter, making him its largest shareholder. Musk had previously had a contentious relationship with Twitter, questioning the company's commitment to free speech and wondering if the company was even needed. Musk initially agreed to join Twitter's board but then abruptly reversed course and shortly thereafter offered to buy the rest of the company. Twitter initially moved to block Musk but then reconsidered, and on April 25, accepted his bid to take over the company for $44 billion and go private, giving him sole control.

But not long thereafter, the deal began to unravel. In mid-May 2022, Musk said he would not proceed with the deal unless Twitter could provide him with evidence that less than 5% of the company's user accounts were actually fake. In securities filings, Twitter has long estimated that false or spam accounts represent less than 5% of its total number of active users but has also said that the actual number could be higher than estimated. In early June Musk reiterated his position and accused Twitter of not complying with his request for data on the number of spam and fake accounts. At the end of June, Twitter provided Musk with access to historical tweet data as well as its so-called "fire hose" of tweets: a data dump of the full stream of all tweets made in near real time. Some analysts believed that Musk was using the issue as a way to renegotiate or even scuttle the deal in light of the stock market downturn. On July 8, 2022, Musk announced that he was terminating the deal. In return, Twitter sued Musk in an attempt to make him complete the purchase at the agreed-upon price. In the meantime, Twitter posted an unexpected drop in advertising revenue for the second quarter in 2022, which Twitter and many analysts attributed to Musk's chaotic acquisition attempt. Finally, in October 2022, Musk agreed to proceed with the purchase. However, that is not the end of the story. Twitter remains in turmoil, with its future uncertain.

Case Study Questions

1. What are Twitter's most important assts?
2. How has Twitter's business model evolved since it was founded?
3. Why is machine learning an important initiative for Twitter?
4. What steps did Twitter take to increase revenues in 2021?
5. Why is Twitter's future currently uncertain?

2.7 REVIEW

KEY CONCEPTS

■ Identify the key components of e-commerce business models.

A successful business model effectively addresses eight key elements:

- *Value proposition*—how a company's product or service fulfills the needs of customers. Typical e-commerce value propositions include personalization, customization, convenience, and reduction of product search and price delivery costs.
- *Revenue model*—how a business plans to earn revenue, generate profits, and produce a superior return on invested capital. Major e-commerce revenue models include the advertising model, subscription model, transaction fee model, sales model, and affiliate model.
- *Market opportunity*—the revenue potential within a company's intended marketspace.
- *Competitive environment*—the direct and indirect competitors doing business in the same marketspace, including how many there are and how profitable they are.
- *Competitive advantage*—the factors that differentiate the business from its competition, enabling it to provide a superior product at a lower cost.
- *Market strategy*—the plan a business develops that outlines how it will enter a market and attract customers.
- *Organizational development*—the process of defining all the functions within a business and the skills necessary to perform each job, as well as the process of recruiting and hiring suitable employees.
- *Management team*—the group of individuals retained to guide the company's growth and expansion.

■ Describe the major B2C business models.

There are a number of different business models being used in the B2C e-commerce arena. The major models include the following:

- *Online retailer (e-tailer)*—enables customers to shop and purchase via a website and/or mobile app; includes virtual merchants (online retail store only), omnichannel (online distribution channel for a company that also has physical stores), and manufacturers selling directly to the consumer (D2C/DTC).
- *Community provider*—creates an online environment where people can "meet" online to connect and communicate; share interests, photos, and video; and, increasingly, transact (buy and sell goods and services); revenue is generated by advertising, subscription fees, transaction fees, and sales revenues and affiliate fees.
- *Content provider*—distributes digital content; typically utilizes an advertising, subscription, or, particularly for creators, affiliate referral fee revenue model.
- *Portal*—offers search tools plus an integrated package of content and services; typically utilizes a combined subscription/advertising revenue/transaction fee model; may be general or specialized (vortal).
- *Transaction broker*—processes online transactions; typically utilizes a transaction fee revenue model.
- *Market creator*—builds a digital environment (market) in which buyers and sellers can meet, display, and search for products and services, establish prices, and transact; typically utilizes a transaction fee revenue model or charges merchants a fee for access to the market.
- *Service provider*—offers services online.

■ Describe the major B2B business models.

The major business models used to date in the B2B arena include:

- *E-distributor*—supplies an online catalog that includes the products of many different manufacturers directly to individual businesses.

- *E-procurement company*—helps businesses automate their procurement process (the range of activities involved in obtaining goods and services).
- *Exchange*—an independent digital marketplace that connects hundreds to potentially thousands of suppliers and buyers.
- *Industry consortium*—industry-owned vertical digital market.
- *Private B2B network*—digital network designed to coordinate the flow of communications and supply chains among firms engaged in business together.

■ Understand key business concepts and strategies applicable to e-commerce.

E-commerce has had a major impact on the business environment in the last decade and has impacted:

- *Industry structure*—the nature of players in an industry and their relative bargaining power by changing the basis of competition among rivals; the barriers to entry; the threat of new, substitute products; the strength of suppliers; and the bargaining power of buyers.
- *Industry value chains*—the set of activities performed in an industry by suppliers, manufacturers, transporters, distributors, and retailers that transform raw inputs into final products and services by reducing the cost of information and other transaction costs.
- *Firm value chains*—the set of activities performed within an individual firm to create final products from raw inputs by increasing operational efficiency.
- *Business strategy*—a set of plans for achieving superior long-term returns on the capital invested in a firm by offering unique ways to differentiate products, such as strategies based on product/service differentiation, cost, scope, focus/market niche, or customer intimacy.
- *Traditional business models*—the business models of many industries have been disrupted and, in some instances made totally obsolete, by e-commerce technologies.

QUESTIONS

1. What is a business model? How does it differ from a business plan?
2. What are the eight key components of an effective business model?
3. What are Amazon's primary customer value propositions?
4. Describe the five primary revenue models used by e-commerce businesses.
5. Why is targeting a market niche generally smarter for a community provider than targeting a large market segment?
6. Would you say that Amazon and eBay are direct or indirect competitors? (You may have to visit their websites or apps to answer this question.)
7. What are some of the specific ways that a business can obtain a competitive advantage?
8. Besides advertising and product sampling, what are some market strategies a business might pursue?
9. How do venture capitalists differ from angel investors?
10. Why is it difficult to categorize e-commerce business models?
11. Besides the examples given in the chapter, what are some other examples of vertical and horizontal portals in existence today?
12. What are the major differences between an online retailer such as Wayfair and an omnichannel retailer such as Walmart? What are the advantages and disadvantages of each business model?
13. What type of business and revenue model do creators typically use?
14. What is the difference between a disruptive technology and a sustaining technology?
15. How does an e-procurement company differ from an exchange?
16. How have the unique features of e-commerce technology changed industry structure in the travel business?
17. Who are the major players in an industry value chain, and how are they impacted by e-commerce technology?

18. What are five generic business strategies for achieving a profitable business?
19. What is the difference between a market opportunity and a marketspace?
20. What is crowdfunding, and how does it help e-commerce companies raise capital?

PROJECTS

1. Select an e-commerce company. Visit its website or mobile app, and describe its business model based on the information you find there. Identify its customer value proposition, its revenue model, the marketspace it operates in, whom its main competitors are, any comparative advantages you believe the company possesses, and what its market strategy appears to be. Also try to locate information about the company's management team and organizational structure. (Check for a page labeled "the Company," "About Us," or something similar.)

2. Examine the experience of shopping online versus shopping in a traditional environment. Imagine that you have decided to purchase an air fryer (or any other item of your choosing). First, shop for the product in a traditional manner. Describe how you would do so (for example, how you would gather the necessary information that you would need to choose a particular item, what stores you would visit, how long it would take, prices, etc.). Next, shop for the item on the Web or via a mobile app. Compare and contrast your experiences. What were the advantages and disadvantages of each? Which did you prefer and why?

3. During the early days of e-commerce, first-mover advantage was touted as one way to success. On the other hand, some suggest that being a market follower can yield rewards as well. Which approach has proven to be more successful—first mover or follower? Choose two e-commerce companies that prove your point, and prepare a brief presentation to explain your analysis and position.

4. Select an e-commerce company that has participated in an incubator program such as Y Combinator, TechStars, Dreamit Ventures, Capital Factory, or another of your choosing, and write a short report on its business model and the amount and sources of capital it has raised thus far. Include your views on the company's prospects for success. Then create an elevator pitch for the company.

5. Select a B2C e-commerce retail industry segment such as pet products, sporting goods, or toys, and analyze its value chain and industry value chain. Prepare a short presentation that identifies the major industry participants in that business and illustrates the move from raw materials to finished product.

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PART 2

- **CHAPTER 3**
  E-commerce Infrastructure: The Internet, the Web, and the Mobile Platform
- **CHAPTER 4**
  Building an E-commerce Presence: Websites, Mobile Sites, and Apps
- **CHAPTER 5**
  E-commerce Security and Payment Systems

Technology Infrastructure for E-commerce

CHAPTER 3

E-commerce Infrastructure: The Internet, the Web, and the Mobile Platform

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

3.1 Discuss the origins of, and the key technology concepts behind, the Internet.
3.2 Explain the current structure of the Internet.
3.3 Understand how the Web works.
3.4 Describe how Internet and web features and services support e-commerce.
3.5 Understand the impact of mobile applications.

NEW Video Cases

See **eText Chapter 3** to watch these videos and complete activities:

3.1 Meter's Internet Infrastructure Vision

3.2 Informatica and the Evolution of Cloud Technology

The Internet Survives the Covid-19 Pandemic:

Why It Didn't Break

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The outbreak of Covid-19 across the world has reshaped many facets of public life. One very important infrastructural pillar that the pandemic tested is the Internet. Demand for broadband Internet access quickly multiplied as people everywhere shifted to working from home, and video traffic, which already comprised a majority of Internet traffic, spiked. Many became concerned: Would Covid-19 "break" the Internet? The quick answer: No, the Internet did not break. The Internet's infrastructure proved to be robust enough to sustain even the prolonged, significant spikes in usage like the ones brought about by the pandemic. There are a number of factors that go into explaining why the Internet was resilient enough to handle the challenge.

To begin, a long-term commitment to good design of the Internet paid off. One of the Internet's biggest strengths is its distributed nature. It is not a single, unitary network; instead, it is a collection of thousands of interconnected but distinct networks and parts. It does not have a single point of failure.

Over the years there have been billions of dollars invested in Internet infrastructure, and during the pandemic, Internet Service Providers (ISPs) continued to work to improve it. For instance, Verizon, AT&T, and Cox all increased the number of fiber connections on their network backbones, added cellular sites, and upgraded routing and switching technology. ISPs were also able to take advantage of network capacity that had previously been built to meet peak demands, putting it to good use to meet surging demand at what were previously non-peak times.

Congestion control algorithms automatically slow down Internet data when online networks get clogged, so that the "pipes" don't become completely gridlocked. And although Internet transmission speeds may slow when there is excessive traffic, typically even those slower speeds can still support functional connectivity. For instance, in New York City during the height of the pandemic, there was a more than 20% decrease in median transmission speed, but even with the decrease, the median speed was still well above the U.S. Federal Communications Commission's definition of high-speed broadband (25 Mbps).

Another factor that increased the resilience of the Internet has been the emergence of what are sometimes referred to as hyperscale cloud computing networks. (As you'll

learn in this chapter, cloud computing is a model of computing in which computer processing, storage, software, and other services are provided as a shared pool of virtualized resources over the Internet.) Today, much of the world's digital services are handled by cloud computing networks run by Amazon Web Services, Microsoft Azure, and Google Cloud. These networks all carry vast amounts of traffic and implement sophisticated architectures with advanced intelligence to route different types of Internet traffic optimally across the globe. This enables the digital services they carry to be flexible in responding to spikes in demand and more easily routed around problems, which proved invaluable during the pandemic.

The growth of content delivery networks (CDNs) such as Akamai (profiled in the closing case study) has also eased the strain on the Internet. By caching and routing video traffic close to local demand, Akamai, Cloudflare, CloudFront, and other CDNs keep that traffic from clogging Internet backbone switches. In addition to video, CDNs also handle e-commerce and gaming traffic, both of which also surged during the pandemic. CDNs provided an important safety valve.

Software built into networks helps to manage Internet traffic to match available bandwidth. Online video companies use such software to automatically downgrade Internet video quality if the network gets too clogged. Many of the tech world's biggest bandwidth consumers, including Netflix and YouTube, did so in certain markets to ease the burden on ISPs at the request of various regulatory agencies.

Although all these factors enabled the Internet to handle the unprecedented rise in traffic during the height of the pandemic, some analysts believe the Internet's ability to do so was much more of a close call than people realize. The sudden increase in demand introduced a new series of problems and challenges for both ISPs and tech companies alike. For instance, according to a study by researchers at Carnegie Mellon, although download Internet performance did not suffer much, upload performance did. Upload performance, even under the best of circumstances, is much slower than download, particularly for cable Internet, where there is typically a major disparity between the two (for example, Comcast's Performance Xfinity package advertises 60 Mbps download speed, but only 5 Mbps upload speed). Upload performance is particularly important for functions such as videoconferencing, which became extremely important during the pandemic.

While the distributed nature of the Internet is one of its greatest strengths, it can also be seen as one of its greatest weaknesses when viewed at a "micro" level. For the Internet to "work" for any particular person, the whole ecosystem has to function: Home Wi-Fi networks, last-mile delivery by ISPs to homes, the private networks relied upon by many of those ISPs, the backbone network to which everything connects, and the exchange points where the interconnections occur all are potential problem points.

On a broader level, the Internet is much more resilient in some countries than in others. For instance, many low-income countries lack redundant interconnection systems and insufficient cable infrastructure. In these countries, the likelihood of Internet outages occurring is much higher than in other countries. The Internet Society, a consortium of corporations, government agencies, and nonprofit organizations that

SOURCES: "Why the Internet Backbone Didn't Bend to the Pandemic," by Stan Gibson, Hpe.com, March 29, 2022; "Comcast Response to Covid-19," Corporate.comcast.com, January 5, 2022; "A New Tool to Measure Internet Resilience—Why It Matters," by Amreesh Phokeer, Internetsociety.org, November 16, 2021; "Why the Internet Didn't Melt Down," by Shira Ovide, *New York Times*, June 30, 2021; "Internet Performance during Covid Not as Great as Many Say, Report Shows," by Daniel Tkacik, Cylab.cmu.edu, June 10, 2021; "Lessons from the Pandemic: Broadband Policy After Covid-19," by Doug Brake, Itif.org,

monitors Internet policies and practices, has launched a new metric that aims to measure Internet resilience. The Internet Society defines a resilient Internet connection as one that maintains an acceptable level of service in the face of challenges to normal operations. The Internet Society's new metric tracks the existence and availability of the physical infrastructure that provides Internet connectivity; the ability of the network to provide end users with seamless and reliable access to Internet service; the ability of the network, via various security technologies, to resist disruptions through security technologies; and the diversity and competitiveness of the market in terms of affordability for end users. The Internet Society notes that each of these four pillars represents core aspects of the Internet, without which the Internet would not be able to operate. The Internet Society's initial focus is on tracking Internet resilience in Africa. South Africa has the highest overall resilience score (69%), but the scores for the majority of countries in Africa are below 50%.

In the United States, the Internet's resilience is likely to get a further boost from the Infrastructure Investment and Jobs Act, signed into law in November 2021, which includes $65 billion for broadband development. Included in the law is $42 billion for the Broadband Equity, Access, and Deployment program, which will send funds to states to underwrite broadband access in areas that are currently underserved. The pandemic has highlighted the importance of the Internet, with increased investment a necessary insurance policy to ensure that it will be equipped to handle the next emergency.

July 13, 2020; "Why the Coronavirus Lockdown Is Making the Internet Stronger than Ever," by Will Douglas Heaven, Technologyreview.com, April 7, 2020; "Why the Internet Didn't Break," by Tom Wheeler, Brookings.edu, April 2, 2020; "COVID-19 Makes It Clear that Broadband Access Is a Human Right," by Stacey Higginbotham, Spectrum.ieee.org, March 27, 2020; "Can the Internet Break from Overuse," by Nathan Chandler, Computer.howstuffworks.com, March 25, 2020; "Why the Internet (Probably) Won't Break during the Coronavirus Pandemic," by Adam Clark Estes, Vox.com/recode, March 25, 2020; "Netflix and YouTube Are Slowing Down in Europe to Keep the Internet from Breaking," by Hadas Gold, Cnn.com, March 20, 2020; "Will the Coronavirus Break the Internet? Highly Unlikely, Says Cloudflare," by Yevgeniy Sverdlik, Datacenterknowledge.com, March 13, 2020; "Will the Coronavirus Break the Internet?" by Aaron Mak, Slate.com, March 12, 2020.

This chapter examines the Internet, Web, and mobile platform of today and tomorrow, how they evolved, how they work, and how their present and future infrastructures enable new business opportunities.

The opening case illustrates the importance of the Internet to everyday life, as well as the importance of understanding how it works. The Internet and its underlying technology are not static phenomena, but instead have changed, and continue to change, over time. Computers have merged with cellphone services; broadband access in the home and broadband wireless access to the Internet via smartphones, tablet computers, and laptops have expanded rapidly; social networks now engage millions of Internet users; and software technologies such as cloud computing and smartphone apps have revolutionized the way businesses use the Internet. Looking forward a few years, the business strategies of the future will require a firm understanding of these technologies and new ones, such as the use of work-from-home technologies, the Internet of Things, the "smart/connected" movement (smart homes, smart TVs, and connected cars), augmented and virtual reality, and artificial intelligence to deliver products and services to consumers. **Table 3.1** summarizes some of the most important developments in e-commerce infrastructure for 2022–2023.

3.1 THE INTERNET: TECHNOLOGY BACKGROUND

What is the Internet? Where did it come from, and how did it support the growth of the Web and e-commerce? What are the Internet's most important operating principles? How much do you really need to know about the technology of the Internet?

Let's take the last question first. The answer is: It depends on your career interests. If you are on a marketing career path, or a general managerial business path, then you need to know the basics about Internet technology, which you'll learn in this and the following chapter. If you are on a technical career path and hope to become a web designer or pursue a technical career in e-commerce infrastructure for businesses, you'll need to start with these basics and then build from there. You'll also need to know about the business side of e-commerce, which you will learn about throughout this book.

Internet
an interconnected network of thousands of networks and millions of computers linking businesses, educational institutions, government agencies, and individuals

Web
one of the Internet's most popular services, providing access to trillions of web pages

As noted in Chapter 1, the **Internet** is an interconnected network of thousands of networks and millions of computers (sometimes called *host computers* or just *hosts*), linking businesses, educational institutions, government agencies, and individuals. The Internet provides more than 4.5 billion people around the world (including about 300 million people in the United States) with services such as e-mail, apps, newsgroups, shopping, research, instant messaging, music, videos, and news (Insider Intelligence/eMarketer, 2022a, 2022b). No single organization controls the Internet or how it functions, nor is it owned by anybody, yet it has provided the infrastructure for a transformation in commerce, scientific research, and culture. The word *Internet* is derived from the word *internetwork*, or the connecting together of two or more computer networks. The **Web** is one of the Internet's most popular services, providing access to trillions of web pages, which are documents created in a programming language called HTML that can contain text, graphics, audio, video, and other objects, as well as "hyperlinks" that permit users to jump easily from one page to another. Web pages are navigated using web browser software.

TABLE 3.1 TRENDS IN E-COMMERCE INFRASTRUCTURE 2022–2023

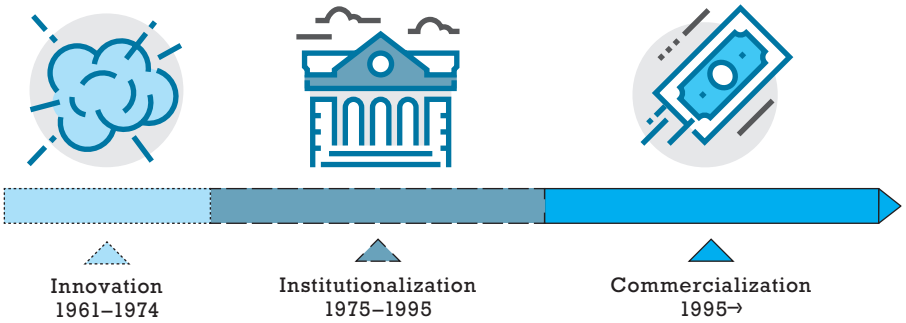
BUSINESS
• The Covid-19 pandemic continues to affect businesses of all kinds worldwide, with both short-term and long-term impacts. • Mobile devices provide a rapidly expanding social marketing and advertising platform and foundation for location-based web services and business models. • The growth in cloud computing and bandwidth capacity enables new business models for distributing content and other types of services online. • Big data (huge sets of structured, semistructured, and unstructured data) produced by the Internet creates new business opportunities for firms with the analytic capability to understand it.
TECHNOLOGY
• The number of Internet users worldwide and amount of time spent online continues to climb, potentially straining Internet and e-commerce infrastructure. • Mobile devices become the dominant mode of access to the Internet; mobile apps threaten the dominance of the Web. • Cloud computing reshapes computing and storage and becomes an important force in the delivery of software applications and online content. • The Internet runs out of IPv4 addresses; the transition to IPv6 continues. • The decreased cost of storage and advances in database software enables the collection and analysis of big data. • 5G cellular technology begins to be widely deployed, providing faster Internet access for mobile devices. • The Internet of Things (IoT), with billions of sensor-equipped devices connecting to the Internet, is powering the development of smart connected "things" such as televisions, houses, cars, and wearable technology. • Artificial intelligence technologies play an increasing role in e-commerce, with applications ranging from supply chain logistics to intelligent personal assistants to autonomous vehicles. • The metaverse, a reenvisioning of the Internet and Web as an immersive experience based on virtual and augmented reality technologies, gains traction with Facebook's rebranding as Meta. • The concept of Web3, a new kind of Internet service premised on blockchain technology and even more decentralized than the current Internet, starts to gain attention.
SOCIETY
• The Covid-19 pandemic creates social and ethical challenges, including new security and privacy issues, as well as heightening concerns about the digital divide. • Conflicts among nations impact governance of the Internet. • Government control over, and surveillance of, the Internet expands in many nations. • Countries such as Russia, China, and Iran increasingly disconnect from the global Internet, creating concerns about the Internet ecosystem fracturing into "splinternets": a collection of isolated networks completely controlled by sovereign nations. • The infrastructure for tracking online and mobile consumer behavior conflicts with intensifying individual claims to privacy and control over personal information.

THE EVOLUTION OF THE INTERNET: 1961–THE PRESENT

Although journalists talk glibly about "Internet" time—suggesting a fast-paced, nearly instantaneous, worldwide global change mechanism—in fact, today's Internet had its start more than 60 years ago and evolved slowly in its first few decades, before accelerating with the development of the Web and mobile platform.

The history of the Internet can be segmented into three phases (see **Figure 3.1**). During the *Innovation Phase*, from 1961 to 1974, the fundamental building blocks of the

FIGURE 3.1 STAGES IN THE DEVELOPMENT OF THE INTERNET



The Internet has developed in three stages from 1961 to the present. In the Innovation stage, basic ideas and technologies were developed; in the Institutionalization stage, these ideas were brought to life; in the Commercialization stage, once the ideas and technologies had been proven, private companies brought the Internet to millions of people worldwide.

Internet—packet-switching hardware, a communications protocol called TCP/IP, and client/server computing (all described more fully later in this section)—were conceptualized and then implemented in actual hardware and software.

During the *Institutionalization Phase*, from 1975 to 1995, large institutions such as the U.S. Department of Defense (DoD) and the National Science Foundation (NSF) provided funding and legitimization for the fledging Internet. Once the concepts behind the Internet had been proven in several government-supported demonstration projects, the DoD funded further development. This effort created what was then called ARPANET (Advanced Research Projects Agency Network). In 1986, the NSF assumed responsibility for the development of a civilian Internet (then called NSFNET) and began a 10-year-long expansion program.

During the *Commercialization Phase*, from 1995 to the present, the U.S. government encouraged private corporations to take over and expand the Internet backbone as well as local service to the rest of the population around the world. See **Table 3.2** for a closer look at the development of the Internet from 1961 on.

TABLE 3.2 DEVELOPMENT OF THE INTERNET TIMELINE

YEAR	EVENT	SIGNIFICANCE
INNOVATION PHASE 1961–1974		
1961	Leonard Kleinrock (MIT) publishes a paper on "packet switching" networks.	The concept of **packet switching** is born.
1962	J. C. R. Licklider (MIT) writes a memo calling for an "Intergalactic Computer Network."	The vision of a global computer network is born.
1969	The first packet-switched message is sent on ARPANET from UCLA to Stanford.	The communications hardware underlying the Internet is implemented for the first time.
1972	E-mail is invented.	The first "killer app" of the Internet is born.
1973	Bob Metcalfe (Xerox PARC Labs) invents Ethernet and local area networks (LANs).	Ethernet and LANs enable the development of **client/server computing**.
1974	"Open architecture" networking and TCP/IP concepts are presented in a paper by Vint Cerf (Stanford) and Bob Kahn (BBN).	The paper provides the conceptual foundation for a single common communications protocol, **TCP/IP**, that could connect disparate LANs and computers, and a common addressing scheme for all computers connected to the network.
INSTITUTIONALIZATION PHASE 1975–1995		
1977	Lawrence Landweber envisions CSNET (Computer Science Network), a network for U.S. university and computer industry research groups.	CSNET is a major milestone on the path to the development of the global Internet.
1980	TCP/IP is officially adopted as the U.S. Department of Defense (DoD) standard communications protocol.	The DoD, the single-largest computing organization in the world at the time, validates TCP/IP.
1981	IBM introduces IBM PC, its first personal computer.	Personal desktop computers provide the foundation for access by millions of people to the Internet.
1984	Apple releases the HyperCard program as part of its Macintosh operating system.	The concept of "hyperlinked" documents that permit a user to jump from one page to another is commercially introduced.
1984	Domain Name System (DNS) is introduced.	DNS provides a user-friendly system for translating IP addresses into words that people can easily understand.
1989	Tim Berners-Lee (CERN) proposes a worldwide network of hyperlinked documents based on a common markup language called HTML—HyperText Markup Language.	The concept of an Internet-supported service called the **World Wide Web** based on **HTML** is born.
1993	Mosaic, the first graphical web browser, is invented.	Mosaic makes it easy for ordinary users to connect to HTML documents anywhere on the Web.
1994	Netscape, the first commercial web browser, becomes available; the first banner advertisements appear on Hotwired.com in October 1994.	The beginning of **e-commerce**.

(continued)

TABLE 3.2 DEVELOPMENT OF THE INTERNET TIMELINE (CONTINUED)

YEAR	EVENT	SIGNIFICANCE
COMMERCIALIZATION PHASE 1995–PRESENT		
1995	Major telecommunications companies take over operation of the Internet backbone. Network Solutions (a private firm) is given a monopoly to assign Internet addresses.	The **fully commercial civilian Internet** is born.
1995	Jeff Bezos founds Amazon.	E-commerce begins in earnest.
1998	The Internet Corporation for Assigned Names and Numbers (ICANN) is created.	Governance over domain names and addresses passes to a private, nonprofit, international organization.
2007	The Apple iPhone is introduced.	The **iPhone** represents the beginning of the development of a viable **mobile platform**.
2008	Internet "cloud computing" becomes a billion-dollar industry.	Internet capacity is sufficient to support on-demand computing resources as well as software applications (**cloud computing**).
2011	ICANN expands the domain name system.	ICANN expands generic top-level domain names from about 300 to potentially thousands.
2012	World IPv6 Launch day.	IPv6 increases the pool of available Internet addresses, enabling continued expansion of the Internet.
2013	The Internet of Things (IoT) starts to become a reality.	Internet technology spreads beyond computers and mobile devices to anything that can be equipped with sensors, paving the way for an **Internet of Things (IoT)**.
2014	Apple introduces Apple Pay and Apple Watch.	Apple Pay becomes the first widely adopted mobile payment system; Apple Watch ushers in a new era of wearable Internet-connected technology.
2019	The commercial availability of 10 Gbps Internet access increases.	Advanced technologies such as virtual reality, augmented reality, artificial intelligence, and 4k streaming video drive demand for faster broadband access speeds.
2020	The Covid-19 pandemic sweeps the globe; Internet usage skyrockets.	The pandemic illustrates the resiliency of the Internet to cope with a tremendous surge in demand.
2021	Facebook rebrands as Meta.	Tremendous hype erupts over the concept of the metaverse: a reenvisioning of the Internet and Web as an immersive 3-D experience.
2022	SpaceX's Starlink takes the lead in the race to deploy low earth orbit (LEO) Internet access satellite systems.	LEO satellite systems can provide broadband Internet access to underserved areas and help bridge the digital divide.

SOURCES: Based on Leiner et al., 2000; Zakon, 2005; Internet Society, 2010; Lasar, 2010; Internet Corporation for Assigned Names and Numbers (ICANN), 2011; Internet Society, 2012; IEEE Computer Society, 2013; NCTA-The Internet & Television Association, 2022.

FIGURE 3.2 RESOLUTION OF THE FEDERAL NETWORKING COUNCIL

"The Federal Networking Council (FNC) agrees that the following language reflects our definition of the term 'Internet.'

'Internet' refers to the global information system that—

(i) is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons;

(ii) is able to support communications using the Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions/follow-ons, and/or other IP-compatible protocols; and

(iii) provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein."

Last modified on October 30, 1995.

SOURCE: Federal Networking Council, 1995.

THE INTERNET: KEY TECHNOLOGY CONCEPTS

In 1995, the Federal Networking Council (FNC) passed a resolution formally defining the term *Internet* as a network that uses the IP addressing scheme, supports Transmission Control Protocol/Internet Protocol (TCP/IP), and makes services available to users much like a telephone system makes voice and data services available to the public (see **Figure 3.2**).

Behind this formal definition are three extremely important concepts that are the basis for understanding the Internet: packet switching, the TCP/IP communications protocol suite, and client/server computing. Although the Internet has evolved and changed dramatically over time, these three concepts are still at the core of the way the Internet functions today and are the foundation for the Internet of the future.

Packet Switching

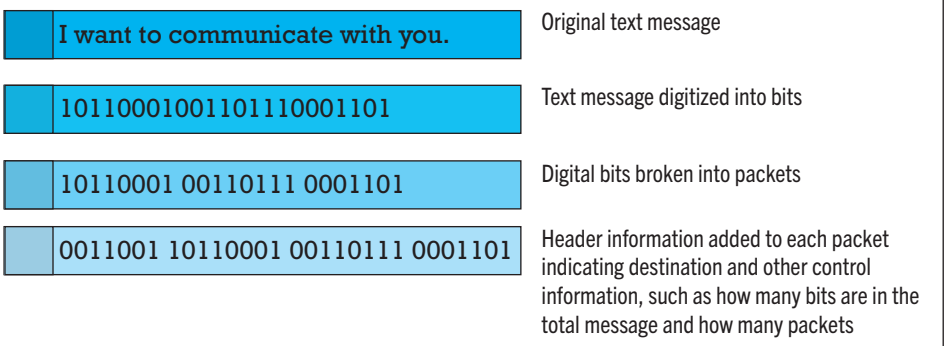
Packet switching is a method of slicing digital messages comprised of bits (binary digits) into discrete units called **packets**, sending the packets along different communication paths as they become available, and then reassembling the packets once they arrive at their destination (see **Figure 3.3**). Prior to the development of packet switching, early computer networks used leased, dedicated telephone circuits to communicate with terminals and other computers. In circuit-switched networks, a complete point-to-point circuit is put together, and then communication can proceed. However, these "dedicated" circuit-switching techniques were expensive and wasted available communications capacity—the circuit would be maintained regardless of whether any data was being sent. A better technology was needed.

With packet switching, the communications capacity of a network can be increased by a factor of 100 or more. In packet-switched networks, messages are first broken down

packet switching
a method of slicing digital messages comprised of bits into packets, sending the packets along different communication paths as they become available, and then reassembling the packets once they arrive at their destination

packets
the discrete units into which digital messages are sliced for transmission over the Internet

FIGURE 3.3 PACKET SWITCHING



In packet switching, digital messages comprised of bits are divided into fixed-length packets. Header information indicates both the origin and the ultimate destination address of the packet, the size of the message, and the number of packets the receiving node should expect. Because the receipt of each packet is acknowledged by the receiving computer, for a considerable amount of time, the network is not passing information, only acknowledgments, producing a delay called latency.

router
special-purpose computer that interconnects the computer networks that make up the Internet and routes packets to their ultimate destination as they travel the Internet

routing algorithm
computer program that ensures that packets take the best available path toward their destination

protocols
rules and standards for data transfer

Transmission Control Protocol/Internet Protocol (TCP/IP)
core communications protocol for the Internet

TCP
establishes connections among sending and receiving computers and handles assembly and reassembly of packets

into packets. Appended to each packet are digital codes that indicate a source address (the origination point) and a destination address, as well as sequencing information and error-control information for the packet. Rather than being sent directly to the destination address, in a packet network, the packets travel from computer to computer until they reach their destination. These computers are called routers. A **router** is a special-purpose computer that interconnects the different computer networks that make up the Internet and routes packets along to their ultimate destination as they travel. To ensure that packets take the best available path toward their destination, routers use a computer program called a **routing algorithm**.

Packet switching does not require a dedicated circuit. Instead it makes use of any spare capacity that is available on any of several hundred circuits. Packet switching makes nearly full use of almost all available communication lines and capacity. Moreover, if some lines are disabled or too busy, the packets can be sent on any other available line that eventually leads to the destination point.

Transmission Control Protocol/Internet Protocol (TCP/IP)

While packet switching was an enormous advance in communications capacity, there was no universally agreed-upon method for breaking up digital messages into packets, routing them to the proper address, and then reassembling them into a coherent message. The answer was to develop **protocols** (rules and standards for data transfer) to govern the formatting, ordering, compressing, and error-checking of messages, as well as to specify the speed of transmission and means by which devices on the network will indicate they have stopped sending and/or receiving messages.

Transmission Control Protocol/Internet Protocol (TCP/IP) (also sometimes referred to as the *Internet protocol suite*) has become the core communications protocol for the Internet (Cerf and Kahn, 1974). TCP/IP is a large family of protocols named after its most important members: TCP and IP. **TCP** establishes the connections among

sending and receiving computers and makes sure that packets sent by one computer are received in the same sequence by the other, without any packets missing. **IP** provides the Internet's addressing scheme and is responsible for the actual delivery of the packets. A third protocol, **UDP** (User Datagram Protocol), is also a key component of the Internet protocol suite and provides an alternative to TCP when the error-checking and correction functionality of TCP is not necessary,

The Internet protocol suite is divided into four separate layers, with each layer handling a different aspect of the communication problem (see **Figure 3.4**). The **Network Interface Layer** is responsible for placing packets on and receiving them from the network medium, which could be a LAN (Ethernet) or other network technology. TCP/IP is independent from any local network technology and can adapt to changes at the local level. The **Internet Layer** is responsible for addressing, packaging, and routing messages on the Internet. The **Transport Layer** is responsible for providing communication with other protocols (applications) within the Internet protocol suite by acknowledging and sequencing the packets to and from the applications. TCP and UDP both operate in this layer. Another protocol, **QUIC**, implements basic transport services within an encrypted envelope and uses UDP to traverse the Internet. QUIC is rapidly emerging as a possible replacement for TCP. For example, Facebook now uses QUIC for more than 75% of its traffic (Sandvine, 2022). The **Application Layer** includes a variety of protocols used to provide user services or exchange data. One of the most important is the **Border Gateway Protocol (BGP)**, which enables the exchange of routing information among different autonomous systems on the Internet. BGP uses TCP as its transport protocol. Other important protocols included in the Application Layer include HyperText Transfer Protocol (HTTP), File Transfer Protocol (FTP), and Simple Mail Transfer Protocol (SMTP), all of which we will discuss later in this chapter.

IP
provides the Internet's addressing scheme and is responsible for delivery of packets

UDP
provides an alternative to TCP when the error-checking and correction functionality of TCP is not necessary

Network Interface Layer
responsible for placing packets on and receiving them from the network medium

Internet Layer
responsible for addressing, packaging, and routing messages on the Internet

Transport Layer
responsible for providing communication with other protocols within the TCP/IP suite

QUIC
implements basic transport services within an encrypted envelope and uses UDP to traverse the Internet

Application Layer
includes protocols used to provide user services or exchange data

Border Gateway Protocol (BGP)
enables exchange of routing information among systems on the Internet

IPv4 Internet address
Internet address expressed as a 32-bit number that appears as a series of four separate numbers marked off by periods, such as 64.49.254.91

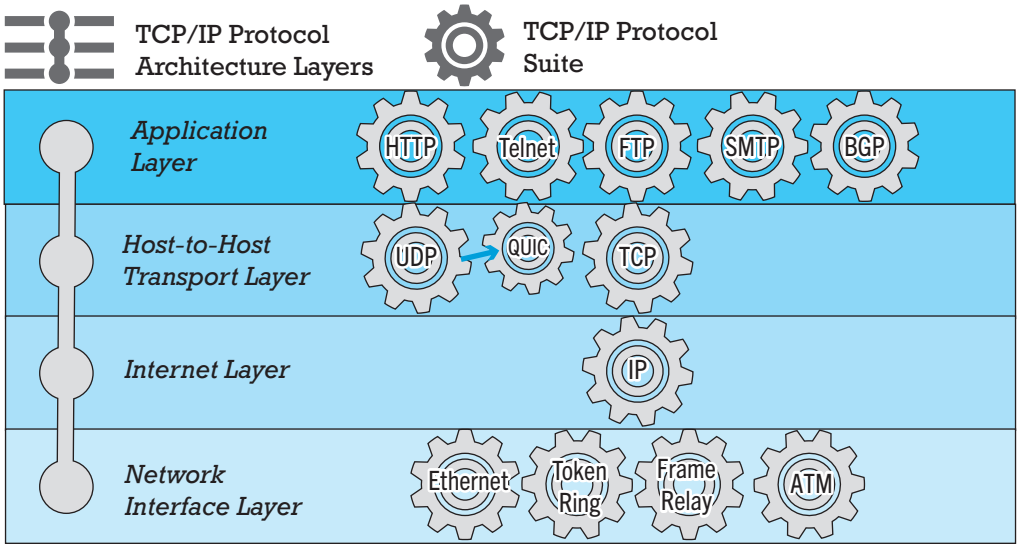
IP Addresses

The IP addressing scheme answers the question "How can billions of devices attached to the Internet communicate with one another?" The answer is that every device connected to the Internet must be assigned an address—otherwise it cannot send or receive TCP packets. For instance, when you sign onto the Internet, your device is assigned a temporary address by your Internet Service Provider. Most corporate and university computers attached to a local area network have a permanent IP address.

There are two versions of IP currently in use: IPv4 and IPv6. An **IPv4 Internet address** is a 32-bit number that appears as a series of four separate numbers marked off by periods, such as 64.49.254.91. Each of the four numbers can range from 0 to 255. This "dotted quad" addressing scheme supports up to about 4 billion addresses (2 to the 32nd power). In a typical network, the first three sets of numbers identify the network (in the preceding example, 64.49.254 is the local area network identification), and the last number (91) identifies a specific device.

Because many large corporate and government domains have been given millions of IP addresses each (to accommodate their current and future needs), and with all the new networks and Internet-enabled devices requiring unique IP addresses being attached to the Internet, the number of IPv4 addresses available to be assigned has shrunk significantly. Registries for North America, Europe, Asia, and Latin America

FIGURE 3.4 TCP/IP ARCHITECTURE AND PROTOCOL SUITE



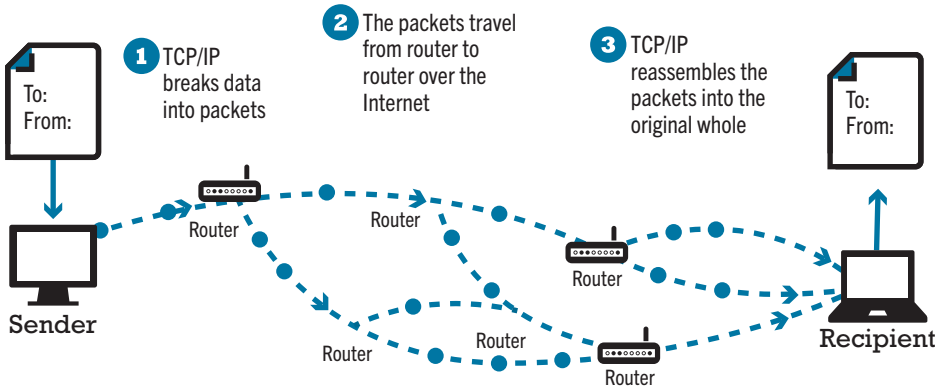
TCP/IP is an industry-standard suite of protocols for large internetworks. The purpose of TCP/IP is to provide high-speed communication network links.

IPv6 Internet address
Internet address expressed as a 128-bit number

have all essentially run out. IPv6 was created to address this problem. An **IPv6 Internet address** is 128 bits, so it can support up to 2^{128}(3.4 × 1038) addresses, many more than IPv4 can. According to Akamai, in the United States about 40% of Internet traffic now occurs over IPv6. (Akamai, 2022).

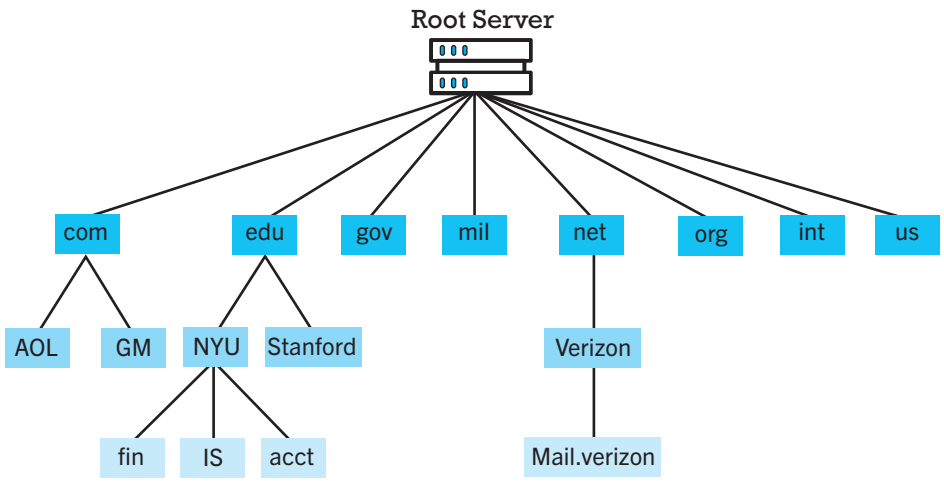
Figure 3.5 illustrates how TCP/IP and packet switching work together to send data over the Internet.

FIGURE 3.5 ROUTING INTERNET MESSAGES: TCP/IP AND PACKET SWITCHING



The Internet uses packet-switched networks and the TCP/IP communications protocol to send, route, and assemble messages. Messages are broken into packets, and packets from the same message can travel along different routes.

FIGURE 3.6 THE HIERARCHICAL DOMAIN NAME SYSTEM



The Domain Name System is a hierarchical namespace with a root server at the top. Top-level domains appear next and identify the organization type (such as .com, .gov, .org, etc.) or geographic location (such as .uk [Great Britain] or .ca [Canada]). Second-level servers for each top-level domain assign and register second-level domain names for organizations and individuals such as IBM.com, Microsoft.com, and Stanford.edu. Finally, third-level domains identify a particular computer or group of computers within an organization, (e.g., www.acct.nyu.edu).

Domain Names, DNS, and URLs

Most people cannot remember 32-bit, let alone 64-bit, numbers. An IP address can be represented by a natural language convention called a **domain name**. The **Domain Name System (DNS)** allows expressions such as Google.com to stand for a numeric IP address. A **Uniform Resource Locator (URL)**, which is the address used by a web browser to identify the location of content on the Web, also uses a domain name as part of the URL. A typical URL contains the protocol to be used when accessing the address, followed by its location. For instance, the URL https://www.google.com refers to the IP address 142.250.65.196, with the domain name google.com and the protocol being used to access the address, HTTPS. We discuss domain names and URLs further in Section 3.4. **Figure 3.6** illustrates the Domain Name System, and **Table 3.3** summarizes the important components of the Internet addressing scheme.

domain name
IP address expressed in natural language

Domain Name System (DNS)
system for expressing numeric IP addresses in natural language

Uniform Resource Locator (URL)
the address used by a web browser to identify the location of content on the Web

TABLE 3.3 PIECES OF THE INTERNET PUZZLE: NAMES AND ADDRESSES

IP addresses	Every device connected to the Internet must have a unique address number called an Internet Protocol (IP) address.
Domain names	The Domain Name System allows expressions such as Pearson.com (Pearson's website) to stand for a numeric IP address.
DNS servers	DNS servers are databases that keep track of IP addresses and domain names on the Internet.
Root servers	Root servers are central directories that list all domain names currently in use for specific domains—for example, the .com root server. DNS servers consult root servers to look up unfamiliar domain names when routing traffic.

Client/Server Computing

client/server computing
a model of computing in which client devices are connected in a network together with one or more servers

client
a device that can request access to services or resources on a network

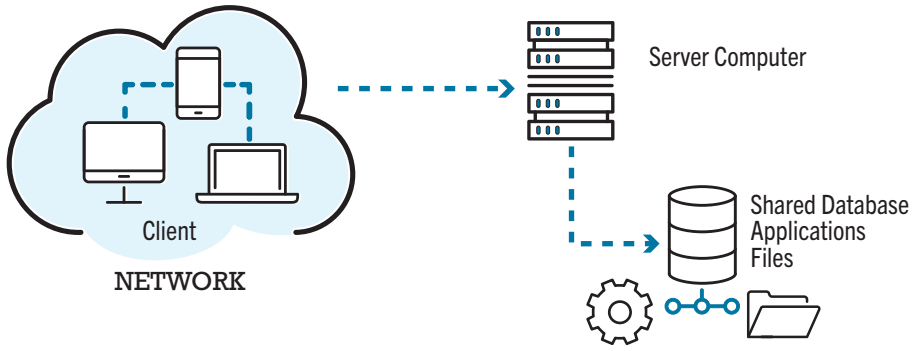
server
a networked computer dedicated to common functions that the client on the network needs

While packet switching greatly expanded the available communications capacity and TCP/IP provided the communications rules and regulations, it took a revolution in computing to bring about today's Internet and the Web. That revolution is known as client/server computing, and without it, the Web—in all its richness—would not exist. **Client/server computing** is a model of computing in which **clients** (various types of devices that can request access to services or resources) are connected in a network with one or more **servers**, which are computers that are dedicated to performing common functions that the clients on the network need, such as file storage, software applications, printing, and Internet access (see **Figure 3.7**). The Internet is a giant example of client/server computing in which millions of web servers located around the world can be easily accessed by millions of clients, also located throughout the world.

To appreciate what client/server computing makes possible, you must understand what preceded it. In the mainframe computing environment of the 1960s and 1970s, computing power was very expensive and limited. There was insufficient computing capacity to support graphics or color in text documents, let alone sound files, videos, or hyperlinked documents. In this period, computing was entirely centralized: All work was done by a single mainframe computer, and users were connected to the mainframe using terminals.

With the development of personal computers and local area networks, client/server computing became possible. Client/server computing has many advantages over centralized mainframe computing. For instance, it is easy to expand capacity by adding servers and clients. Also, client/server networks are less vulnerable than centralized computing architectures. If one server goes down, backup or mirror servers can pick up the slack; if a client device is inoperable, the rest of the network continues operating. Moreover, processing load is balanced over many powerful smaller computers rather than concentrated in a single huge computer that performs processing for everyone. Both software and hardware in client/server environments can be built more simply and economically.

FIGURE 3.7 THE CLIENT/SERVER COMPUTING MODEL



In the client/server model of computing, client devices are connected in a network together with one or more servers.

THE MOBILE PLATFORM

Today, the primary means of accessing the Internet both in the United States and worldwide is through smartphones and tablet computers rather than traditional desktop or laptop computers. This means that the primary platform for e-commerce is also changing to the mobile platform.

Smartphones such as Apple's iPhone, which uses Apple's iOS operating system, and Samsung's Galaxy line, which uses Google's Android operating system, have radically altered the e-commerce landscape. Around 260 million people in the United States use a mobile phone to access the Internet at least some of the time. Tablets such as the Apple iPad, Microsoft Surface, and hundreds of other competitors are extremely light, do not require a complex operating system, and rely on the Internet to provide processing and storage. In the United States, about 170 million people access the Internet using a tablet computer (Insider Intelligence/eMarketer, 2022c, 2022d).

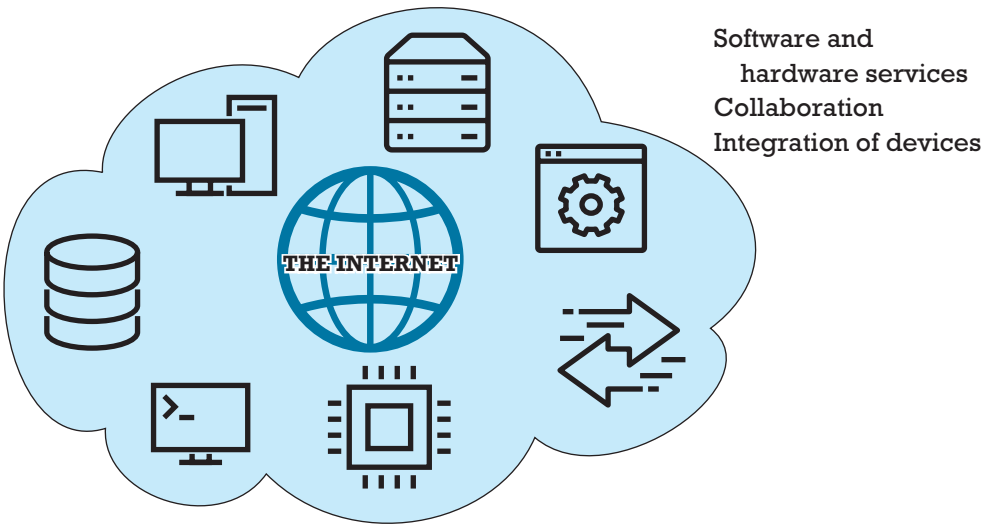
The mobile platform has profound implications for e-commerce because it influences how, where, and when consumers shop and buy. We discuss mobile access to the Internet further in Section 3.2.

THE INTERNET "CLOUD COMPUTING" MODEL: HARDWARE AND SOFTWARE AS A SERVICE

cloud computing model of computing in which computer processing, storage, software, and other services are provided as a shared pool of virtualized resources via the Internet

Cloud computing is a model of computing in which computer processing, storage, software, and other services are provided as a shared pool of virtualized resources via the Internet. These "clouds" of computing resources can be accessed on an as-needed basis from any connected device and location. **Figure 3.8** illustrates the cloud computing concept. (View the Figure 3.8 video in the eText for an animated and more detailed discussion of this figure.)

FIGURE 3.8 THE CLOUD COMPUTING MODEL



In the cloud computing model, hardware and software services are provided to clients via the Internet.

The U.S. National Institute of Standards and Technology (NIST) defines cloud computing as having the following essential characteristics:

- **On-demand self-service:** Consumers can obtain computing capabilities such as server time or network storage as needed automatically on their own.
- **Ubiquitous network access:** Cloud resources can be accessed using standard network and Internet devices, including mobile platforms.
- **Location-independent resource pooling:** Computing resources are pooled to serve multiple users, with different virtual resources dynamically assigned according to user demand. The user generally does not know where the computing resources are located.
- **Rapid elasticity:** Computing resources can be rapidly provisioned, increased, or decreased to meet changing user demand.
- **Measured service:** Charges for cloud resources are based on the amount of resources actually used.

Cloud computing consists of three basic types of services:

- **Infrastructure as a service (IaaS):** Customers use processing, storage, networking, and other computing resources from third-party providers called cloud service providers (CSPs) to run their information systems. For example, Amazon used the spare capacity of its information technology infrastructure to develop Amazon Web Services (AWS), which offers a cloud environment for a myriad of different IT infrastructure services. See **Table 3.4** for a description of the range of services that AWS offers, such as its Simple Storage Service (S3) for storing customers' data and its Elastic Compute Cloud (EC2) service for running applications. Users pay only for the computing and storage capacity they use.
- **Software as a service (SaaS):** Customers use software hosted by the vendor on the vendor's cloud infrastructure and delivered as a service over a network. Leading SaaS examples includes Google's Workspace, which provides common business applications online, and Salesforce.com, which provides customer relationship management and related software services via the Internet. Users access these applications from a web browser, and the data and software are maintained on the providers' remote servers.
- **Platform as a service (PaaS):** Customers use infrastructure and programming tools supported by the CSP to develop their own applications. For example, IBM offers IBM Cloud for software development and testing on its cloud infrastructure. Another example is Salesforce.com's Lightning Platform, which allows developers to build applications that are hosted on its servers as a service.

public cloud
third-party service providers that own and manage large, scalable data centers that offer processing, storage, networking, and other computing resources to multiple customers who pay for only the resources they use

A cloud can be private, public, or hybrid. A **public cloud** is owned and maintained by a CSP, such as Amazon Web Services, Microsoft, Google, or IBM, and made available to multiple customers, who pay only for the resources they use. A public cloud offers relatively secure enterprise-class reliability at significant cost savings. Because organizations using public clouds do not own the infrastructure, they do not have to make large investments in their own hardware and software. Instead, they purchase their computing services from remote providers and pay only for the computing resources they use (utility computing) or are billed on a monthly or annual subscription basis.

TABLE 3.4 AMAZON WEB SERVICES

NAME	DESCRIPTION
Elastic Compute Cloud (EC2)	Scalable cloud computing services
Simple Storage Service (S3)	Data storage infrastructure
DynamoDB	NoSQL database service
Redshift	Petabyte-scale data warehouse service
Relational Database Service (RDS)	Relational database service for MySQL, Oracle, SQL Server, and PostgreSQL databases
Route 53	DNS service in the cloud, enabling business to direct Internet traffic to web applications
CloudFront	Content delivery services
Elastic MapReduce (EMR)	Web service that enables users to perform data-intensive tasks
Kinesis	Big data service
AppStream	Streaming services for applications and games
CloudSearch	Search service that can be integrated by developers into applications
Simple Email Service (SES)	Cloud e-mail service
Identity and Access Management (IAM)	Enables securely controlled access to AWS services
CloudWatch	Monitoring service
Elastic Beanstalk	Service for deploying and scaling web applications and services
Cognito	Allows developers to securely manage and synchronize app data for users across mobile devices
Mobile Analytics	Can collect and process billions of events from millions of users a day
Flexible Payment Service (FPS)	Payment services for developers
Amazon Mechanical Turk	Marketplace for work that requires human intelligence
Alexa Web Information Service	Provides web traffic data and information for developers

The term *on-demand computing* is also used to describe such services. As such, public clouds are ideal environments for small and medium-sized businesses that cannot afford to fully develop their own infrastructure; for applications requiring high performance, scalability, and availability; for new application development and testing; and for companies that have occasional large computing projects. Gartner estimates that spending on public cloud services worldwide (not including cloud advertising) will grow by more than 20% in 2022, to nearly $500 billion (Gartner, Inc., 2022). Companies such as Google, Apple, Dropbox, Box, and others also offer public clouds as a consumer service for online storage of data, music, and photos. Google Drive and Apple iCloud are leading examples of this type of consumer cloud service.

private cloud
provides similar options as a public cloud but only to a single organization

A **private cloud** provides similar options as a public cloud but is operated solely for the benefit of a single organization. It might be managed by the organization or a third party and hosted either internally or externally. Like public clouds, private clouds can allocate storage, computing power, or other resources seamlessly to provide computing resources on an as-needed basis. Companies that have stringent regulatory compliance or specialized licensing requirements that necessitate high security, such as financial services or health care companies, or that want flexible information technology resources and a cloud service model while retaining control over their own IT infrastructure typically use private clouds.

hybrid cloud
use of both a public cloud and a private cloud

Large firms are most likely to adopt a **hybrid cloud** computing model in which they use a private cloud for their most essential core activities and adopt public cloud computing for less critical systems or for additional processing capacity during peak business periods. **Table 3.5** compares the three cloud computing models. Cloud computing will gradually shift firms from having a fixed infrastructure capacity toward a more flexible infrastructure, some of it owned by the firm and some of it rented from giant data centers owned by CSPs.

edge computing
optimizes cloud computing by shifting some of the processing and data storage load to servers located closer to end users, at the so-called "edge" of the network, thus improving response time and saving bandwidth

Cloud computing has some drawbacks. Unless users make provisions for storing their data locally, the responsibility for data storage and control is in the hands of the provider. Some companies worry about the security risks related to entrusting their critical data and systems to an outside vendor that also works with other companies. Companies expect their systems to be available 24/7 and do not want to suffer any loss of business capability if cloud infrastructures malfunction. In addition, cloud computing can introduce delays in the processing and transmitting of data because the data must travel over a network to a remote cloud data center and then back to the end user. To deal with this issue, firms such as Akamai (see the case study at the end of the chapter) developed edge computing services. **Edge computing** optimizes cloud computing by shifting some of the processing and data storage load to servers located closer to end users, at the so-called "edge" of the network. This improves response time and saves bandwidth.

TABLE 3.5 CLOUD COMPUTING MODELS COMPARED

TYPE OF CLOUD	DESCRIPTION	MANAGED BY	TYPICALLY USED BY
Public cloud	Third-party service offering computing, storage, and software services to multiple customers	Third-party service providers (CSPs)	Companies without major privacy concerns Companies seeking pay-as-you-go IT services Companies lacking IT resources and expertise
Private cloud	Cloud infrastructure operated solely for a single organization and hosted either internally or externally	In-house IT or private third-party host	Companies with stringent privacy and security requirements Companies that must have control over data sovereignty
Hybrid cloud	Combination of private and public cloud services that remain separate entities	In-house IT, private host, third-party providers	Companies requiring some in-house control of IT that are also willing to assign part of their IT infrastructures to a public cloud

Cloud computing has many significant implications for e-commerce. For e-commerce firms, cloud computing radically reduces the cost of building and operating websites because the necessary hardware infrastructure and software can be licensed as a service from CSPs at a fraction of the cost of purchasing these services as products. This means firms can adopt "pay-as-you-go" and "pay-as-you-grow" strategies when building out their businesses. For instance, according to Amazon, hundreds of thousands of customers use Amazon Web Services. For individuals, cloud computing means you no longer need a powerful laptop or desktop computer to engage in e-commerce or other activities. Instead, you can use much less expensive tablet computers or smartphones. For businesses, cloud computing means that a significant part of hardware and software costs (infrastructure costs) can be reduced because firms can obtain these services online for a fraction of the cost of owning them, and they do not have to hire an IT staff to support the infrastructure.

OTHER INTERNET PROTOCOLS

There are many other Internet protocols that enable various services on the Internet, such as the transfer of web pages, e-mail, file transfer, and security. These protocols are not owned by any organization but have been developed over many years and are available to all Internet users.

HyperText Transfer Protocol (HTTP) is the Internet protocol used to transfer web pages (described in the following section). HTTP was developed by the World Wide Web Consortium (W3C) and the Internet Engineering Task Force (IETF). HTTP runs in the Application Layer of the TCP/IP model shown in Figure 3.4. An HTTP session begins when a client's browser requests a resource, such as a web page, from a remote Internet server. When the server responds by sending the page requested, the HTTP session for that object ends. Because web pages may have many objects on them—graphics, sound or video files, frames, and so forth—each object must be requested by a separate HTTP message. An updated version of HTTP, HTTP/2, enhances website performance by eliminating the need to open multiple TCP connections between a client and a server (known as multiplexing), thus allowing servers to push resources to a client without the client having to request them (known as server push), and reducing the HTTP header size (header compression). HTTP/2 also has security benefits, with improved performance for encrypted data. HTTP/2 is supported by almost all the leading web browsers, but as of June 2022, it has been adopted only by less than half of all websites, in part due to the challenges involved for organizations in transitioning their applications from HTTP to HTTP/2. An even newer version of HTTP, HTTP/3, is being used by around 25% of websites. HTTP/3 uses QUIC rather than TCP as a transport protocol (W3techs, 2022; Bishop, 2021). HTTPS, which we discuss further in Chapter 5, is a more secure version of HTTP.

E-mail is one of the oldest, most important, and frequently used Internet services. Like HTTP, the various Internet protocols used to handle e-mail all run in the Application Layer of TCP/IP. **Simple Mail Transfer Protocol (SMTP)** is the Internet protocol used to send e-mail to a server. SMTP is a relatively simple, text-based protocol that was developed in the early 1980s. SMTP handles only the sending of e-mail. To retrieve e-mail from a server, the client computer uses either **Post Office Protocol 3 (POP3)** or **Internet Message Access Protocol (IMAP)**. You can set POP3 to retrieve e-mail messages from the server and then delete the messages on the server or retain them on the server.

HyperText Transfer Protocol (HTTP)
the Internet protocol used for transferring web pages

Simple Mail Transfer Protocol (SMTP)
the Internet protocol used to send e-mail to a server

Post Office Protocol 3 (POP3)
a protocol used by the client to retrieve e-mail from an Internet server

Internet Message Access Protocol (IMAP)
a more current e-mail protocol that allows users to search, organize, and filter their e-mail prior to downloading it from the server

IMAP is a more current e-mail protocol and allows users to search, organize, and filter their e-mail prior to downloading it from the server.

File Transfer Protocol (FTP) is one of the original Internet services. FTP runs in TCP/IP's Application Layer and permits users to transfer files from a server to their client computer, and vice versa. The files can be documents, programs, or large database files. FTP is a fast and convenient way to transfer large files. Today, however, FTP has been mostly supplanted by more secure protocols, such as FTPS (FTP over SSL), which adds encryption as a security measure, and SFTP (SSH File Transfer Protocol), which adds even more security features (Horan, 2020).

File Transfer Protocol (FTP)
protocol that permits users to transfer files from the server to their client computer, and vice versa

Secure Sockets Layer (SSL) was the original protocol enabling secure communications between a client and a server over the Internet. Today, however, it has been replaced by the **Transport Layer Security (TLS)** protocol, which is an updated, more secure version of SSL. Both SSL and TSL operate between the Transport and the Application Layers of TCP/IP. TLS helps secure e-commerce communications and payments through a variety of techniques, such as message encryption and digital signatures, that we will discuss further in Chapter 5.

Secure Sockets Layer (SSL)
original protocol enabling secure communications between a client and a server over the Internet

Transport Layer Security (TLS)
updated, more secure version of SSL

3.2 INTERNET INFRASTRUCTURE AND ACCESS

In 2022, there are an estimated 4.5 billion Internet users worldwide, up from 100 million users at year-end 1997. While this is a huge number, it still represents only about 57% of the world's population. Although Internet user growth has slowed in the United States and Western Europe to about 1% – 1.5%, the growth rate in other regions such as Middle East/Africa and Asia-Pacific is somewhat higher, with the Middle East/Africa estimated to grow by about 3% over the next five years and Asia-Pacific by about 2%. By 2026, it is expected that there will be an estimated 4.9 billion Internet users worldwide (Insider Intelligence/eMarketer, 2022e). As discussed in the opening case, one might think the Internet would be overloaded with such incredible growth; however, this has not been true for several reasons. First, client/server computing is highly extensible. By simply adding servers and clients, the population of Internet users can grow indefinitely. Second, the Internet architecture is built in layers so that each layer can change without disturbing developments in other layers. For instance, the technology used to move messages through the Internet can go through radical changes to make service faster without being disruptive to your desktop applications running on the Internet.

Network Technology Substrate layer
layer of Internet architecture that is composed of telecommunications networks and protocols

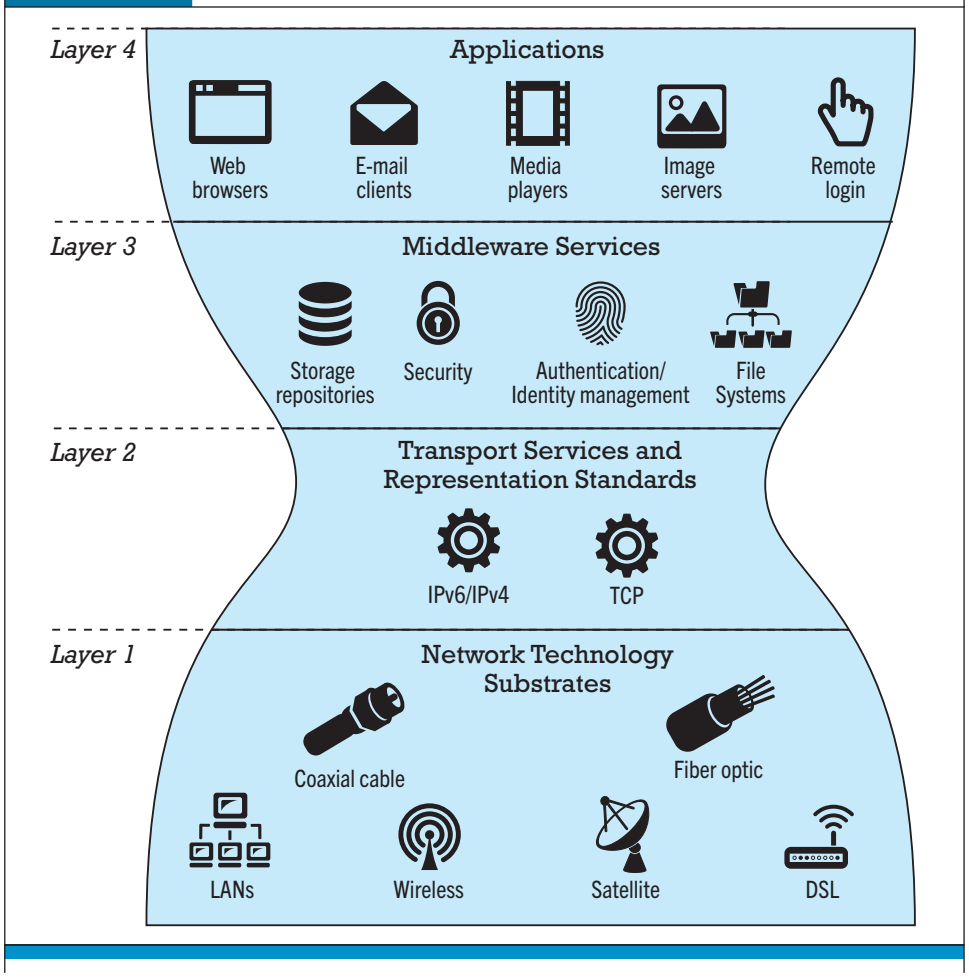
Transport Services and Representation Standards layer
layer of Internet architecture that houses the TCP/IP protocol

Applications layer
layer of Internet architecture that contains client applications

Figure 3.9 illustrates the "hourglass" and layered architecture of the Internet. The Internet can be viewed conceptually as having four layers. The **Network Technology Substrate layer** is composed of telecommunications networks and protocols. The **Transport Services and Representation Standards layer** houses the TCP/IP protocol. The **Applications layer** contains client applications such as the Web, e-mail, and audio or video playback. The **Middleware Services layer** is the glue that ties the Applications layer to the other layers and includes such services as security, authentication, addresses, and storage repositories. Users work with applications (such as e-mail) and rarely are aware of the middleware that operates in the background.

Middleware Services layer
layer of Internet architecture that ties the Applications layer to the other layers

FIGURE 3.9 THE HOURGLASS MODEL OF THE INTERNET



The Internet can be characterized as a modular hourglass structure with a lower layer containing the bit-carrying infrastructure (including cables and switches) and an upper layer containing user applications such as e-mail and the Web. In the narrow waist are transportation protocols such as TCP/IP.

Because all layers use TCP/IP and other common standards linking all four layers, it is possible for there to be significant changes in the Network Technology Substrate layer without forcing changes in the Applications layer. (Note that the TCP/IP communications protocol also has layers, which should not be confused with these Internet architecture layers.)

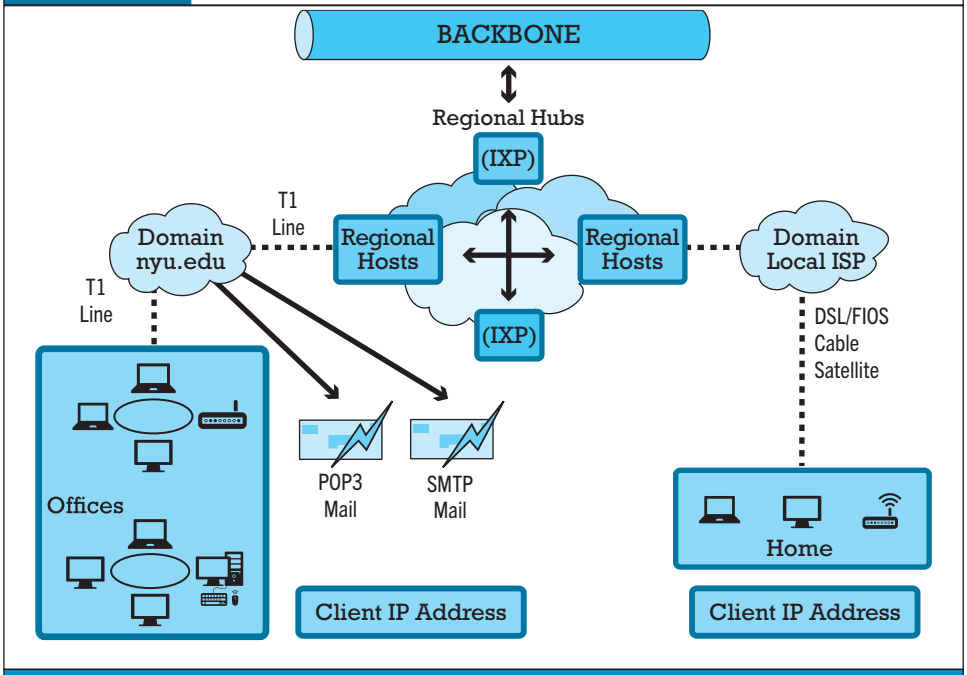
THE INTERNET BACKBONE

Figure 3.10 illustrates some of the main physical elements of today's physical Internet. The Internet's **backbone** is created by numerous privately owned networks comprised of high-bandwidth fiber-optic cables that are physically connected to each other and that transfer information from one private network to another. (**Fiber-optic cable** consists of up to hundreds of strands of glass or plastic that use light to transmit data. It

backbone
high-bandwidth fiber-optic cable networks that transport data around the world

fiber-optic cable
consists of up to hundreds of strands of glass or plastic that use light to transmit data

FIGURE 3.10 INTERNET NETWORK ARCHITECTURE



Today's Internet has a multi-tiered open network architecture featuring multiple backbones, regional hubs, campus/corporate area networks, and local client computers.

Tier 1 Internet Service Providers (Tier 1 ISPs) own and control the major long-haul fiber-optic cable networks comprising the Internet's backbone

often replaces existing coaxial and twisted copper cabling because it can transmit much more data at faster speeds, with less interference and better data security. Fiber-optic cable is also thinner and lighter, taking up less space during installation.) These long-haul fiber-optic networks are owned by firms sometimes referred to as **Tier 1 Internet Service Providers (Tier 1 ISPs)** (also sometimes called transit ISPs) (see **Table 3.6**). Tier 1 ISPs have "peering" arrangements with other Tier 1 ISPs to allow Internet traffic to flow through each other's cables and equipment without charge. Tier 1 ISPs deal only with other Tier 1 or Tier 2 ISPs (described in the next section) and not with end consumers. For the sake of simplicity, we will refer to these networks of backbones as a single "backbone." **Bandwidth** measures how much data can be transferred over a communications medium within a fixed period of time and is usually expressed in bits per second (Bps),

bandwidth measures how much data can be transferred over a communications medium within a fixed period of time

TABLE 3.6 MAJOR U.S. TIER 1 (TRANSIT) INTERNET SERVICE PROVIDERS

AT&T	NTT Communications (America)
Cogent Communications	T-Mobile (formerly Sprint)
GTT Communications	Verizon
Lumen Technologies (formerly CenturyLink)	Zayo Group

kilobits (thousands of bits) per second (Kbps), megabits (millions of bits) per second (Mbps), or gigabits (billions of bits) per second (Gbps). In the United States, the backbone can carry data at rates of up to 100 Gbps.

Connections to other continents are made via a combination of undersea fiber-optic cable and satellite links. Increasingly, rather than leasing bandwidth from Tier 1 ISPs, Internet giants such as Amazon, Google, Microsoft, and Meta are laying down their own undersea fiber-optic networks. The backbone also has built-in redundancy so that if one part breaks down, data can be rerouted to another part of the backbone. **Redundancy** refers to multiple duplicate devices and paths in a network. A map of the Internet's long-haul fiber network in the United States reveals that, not surprisingly, there are dense networks of fiber in the Northeast and coastal areas, while there is a pronounced absence of infrastructure in the Upper Plains and Four Corners regions (Simonite, 2015; Durairajan et al., 2015).

redundancy
multiple duplicate devices and paths in a network

INTERNET EXCHANGE POINTS

In the United States, there are a number of regional hubs where Tier 1 ISPs physically connect with one another and/or with regional (Tier 2) ISPs. Tier 2 ISPs exchange Internet traffic both through peering arrangements as well as through purchasing Internet transit, and they connect Tier 1 ISPs with Tier 3 ISPs, which provide Internet access to consumers and business. Tier 3 ISPs are described further in the next section. These hubs were originally called Network Access Points (NAPs) or Metropolitan Area Exchanges (MAEs) but now are more commonly referred to as **Internet Exchange Points (IXPs)** (see **Figure 3.11**).

Internet Exchange Point (IXP)
hub where the backbone intersects with local and regional networks and where backbone owners connect with one another

TIER 3 INTERNET SERVICE PROVIDERS

The firms that provide the lowest level of service in the multi-tiered Internet architecture by leasing Internet access to homeowners, small businesses, and some large institutions are sometimes called **Tier 3 Internet Service Providers (Tier 3 ISPs)**. Tier 3 ISPs are retail providers. They deal with "the last mile of service" to the curb—homes and business offices. Tier 3 ISPs typically connect to IXPs with high-speed telephone or cable lines.

Tier 3 Internet Service Provider (Tier 3 ISP)
firm that provides the lowest level of service in the multi-tiered Internet architecture by leasing Internet access to homeowners, small businesses, and some large institutions

Three companies, Comcast, Charter Spectrum (which moved up the ladder with its purchase of Time Warner Cable and Bright House Networks), and AT&T, together control almost half of the "last mile" wired infrastructure in the United States. Other major Tier 3 ISPs include Verizon, Altice (Optimum Online), Lumen Technologies (formerly CenturyLink), and Cox. There are also thousands of smaller, local access ISPs. If you have home or small business Internet access, a Tier 3 ISP likely provides the service to you. (It's important to note that many Tier 3 ISPs are also Tier I ISPs; the two roles are not mutually exclusive.) Satellite firms also offer Internet access, especially in remote areas where other types of broadband service are not available.

Table 3.7 summarizes the variety of Internet access services available to consumers and businesses. There are two main types of service: narrowband and broadband. **Narrowband** service is the traditional telephone modem connection ("dial-up") operating at 56.6 Kbps. This used to be the most common form of connection, but it has been largely replaced by broadband connections in the United States and elsewhere

narrowband
traditional telephone modem connection operating at 56.6 Kbps

FIGURE 3.11 SOME MAJOR U.S. INTERNET EXCHANGE POINTS (IXPS)

Region	Name	Location	Operator
EAST	Boston Internet Exchange (BOSIX)	Boston	Markley
	New York International Internet Exchange (NYIIX)	New York	Telehouse
	Peering and Internet Exchange (PAIX)	New York, Virginia, Atlanta	Equinix
	NAP of the Americas	Miami	Verizon Terremark
CENTRAL	Any2 Exchange	Chicago	CoreSite
	Peering and Internet Exchange (PAIX)	Dallas	Equinix
	Midwest Internet Cooperative Exchange (MICE)	Minneapolis	Members
WEST	Peering and Internet Exchange (PAIX)	Seattle, Palo Alto	Equinix
	Los Angeles International Internet Exchange (LAIIX)	Los Angeles	Telehouse
	Any2 Exchange	San Jose, Los Angeles	CoreSite
	Seattle Internet Exchange (SIX)	Seattle	Members

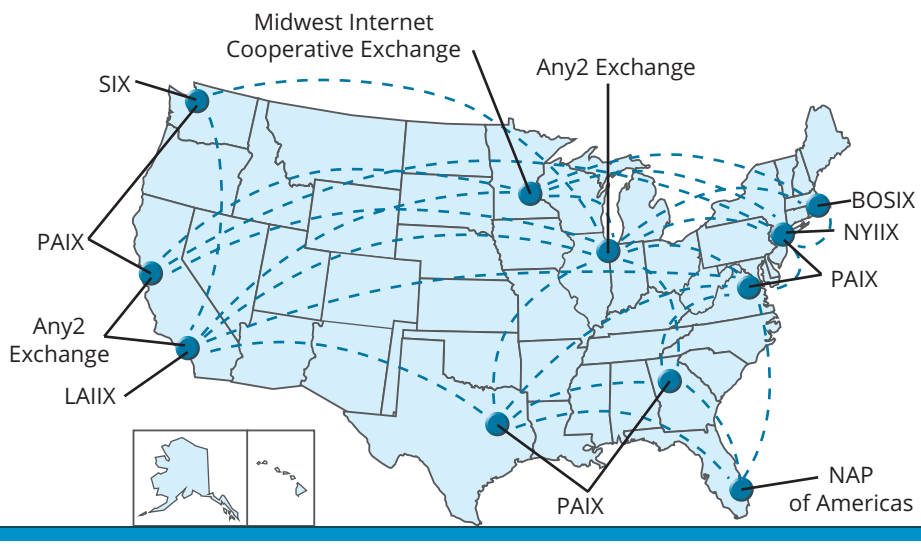


TABLE 3.7 INTERNET ACCESS SERVICE CHOICES

SERVICE	DOWNLOAD SPEED
Telephone modem	30–56 Kbps
DSL	1–35 Mbps
FiOS	25–940 Mbps
Cable Internet	15–600 Mbps
Geostationary (GEO) Satellite	5–100 Mbps
Low-earth orbit (LEO) Satellite	50–150 Mbps
T1	1.54 Mbps
T3	45 Mbps

(United States Census Bureau, 2020). Broadband service is based on DSL (including high-speed fiber-optic service), cable, telephone (T1 and T3 lines) (DSL, cable, and telephone-based broadband are often referred to as *fixed broadband*), and satellite technologies. **Broadband**, in the context of Internet service, refers to any communication technology that permits clients to play streaming audio and video files at acceptable speeds. The Federal Communications Commission (FCC) currently defines broadband as providing service at a minimum of 25 Mbps for downloads and 3 Mbps for uploads. Note that this is well below the global average of about 65 Mbps for downloads and 28 Mbps for uploads (Federal Communications Commission, 2015; Speedtest, 2022). Although the FCC claims that around 70% of all U.S. households have access to fixed broadband that meets or exceeds the FCC's minimum requirements, other surveys have reported that the percentage is much lower. For example, a report by the NPD Group in 2022 found that only 50% of households in the continental United States had access to broadband that delivers download speed of 25 Mbps, and that 34% of households had Internet access at speeds of less than 5 Mbps only. People residing in rural areas of the United States are particularly underserved (Federal Communications Commission, 2021; NPD Group, 2022).

broadband
refers to any communication technology that permits clients to play streaming audio and video files at acceptable speeds

The actual throughput of data is not guaranteed and will depend on a variety of factors including noise in the line and the number of subscribers requesting service. Service-level speeds quoted are typically only for downloads of Internet content; upload speeds tend to be slower, although a number of broadband ISPs have plans that offer the same upload and download speeds.

Digital Subscriber Line (DSL) service is a telephone technology that provides high-speed access to the Internet through ordinary telephone lines found in a home or business. Service levels typically range from about 1 to 35 Mbps. DSL service requires that customers live within two miles (about 4,000 meters) of a neighborhood telephone switching center. In order to compete with cable companies, telephone companies now also offer an advanced form of DSL called **FiOS (fiber-optic service)** that provides up to 940 Mbps to homes and businesses.

Digital Subscriber Line (DSL)
delivers high-speed access through ordinary telephone lines found in homes or businesses

FiOS (fiber-optic service)
a form of DSL that provides speeds of up to 940 Mbps

cable Internet
piggybacks digital access to the Internet on top of the video cable providing television signals to a home

Cable Internet refers to a cable television technology that piggybacks digital access to the Internet using the same digital video cable providing television signals to a home. Cable Internet is a major broadband alternative to DSL service, generally providing faster speeds and a "triple play" subscription: telephone, television, and Internet for a single monthly payment. However, the available bandwidth of cable Internet is shared with others in the neighborhood using the same cable. When many people are attempting to access the Internet over the cable at the same time, speeds may slow, and performance will suffer. Cable Internet services typically range from 15 Mbps up to 600 Mbps. Comcast, Charter Spectrum, Cox, and Altice (Optimum Online) are some of the major cable Internet providers.

satellite Internet
high-speed broadband Internet access provided via satellite

Satellite Internet provides high-speed broadband Internet access via satellite. There are two types of satellite Internet access. Traditional satellite Internet is based on geostationary (GEO) satellites. Access speeds and monthly costs are comparable to DSL and cable but typically require a higher initial payment for installation of a small (18-inch) satellite dish. Upload speeds tend to be slower, typically 5–100 Mbps. Satellite providers typically have policies that limit the total megabytes of data that a single account can download within a set period, usually monthly. The major traditional satellite providers are Dish, HughesNet, and Viasat. The second type of satellite Internet access is based on low earth orbit (LEO) satellites. Access speeds and costs are ultimately expected to be superior to that offered by traditional satellite Internet. *The Insight on Technology* case, *The Internet Space Race*, examines the technology behind, and the issues associated with, the race to create LEO satellite networks and how they may impact Internet access.

T1
an international telephone standard for digital communication that offers guaranteed delivery at 1.54 Mbps

T3
an international telephone standard for digital communication that offers guaranteed delivery at 45 Mbps

T1 and T3 are international telephone standards for digital communication. **T1** lines offer guaranteed delivery at 1.54 Mbps, while **T3** lines offer 45 Mbps. Despite their relatively low speeds, T1 and T3 are still used because they provide dedicated lines for government agencies and businesses that require guaranteed service levels.

Today in the United States, nearly all businesses and government agencies have broadband connections to the Internet. Demand for broadband service has grown so rapidly because it greatly speeds up the process of downloading web pages and large video and audio files (see **Table 3.8**). As the quality of Internet service offerings continues to expand, the demand for broadband access will continue to swell.

TABLE 3.8 TIME TO DOWNLOAD A 10-MEGABYTE FILE BY TYPE OF INTERNET SERVICE

TYPE OF INTERNET SERVICE	TIME TO DOWNLOAD
Telephone modem @ 56 Kbps	25 minutes
DSL @ 1 Mbps	1.33 minutes
T1 @ 1.54 Mbps	52 seconds
Cable Internet @ 25 Mbps	3 seconds
T3 @ 45 Mbps	2 seconds
Cable Internet @ 100 Mbps	0.84 second
Cable Internet @ 1 Gbps	0.08 second

INSIGHT ON TECHNOLOGY

THE INTERNET SPACE RACE

The Covid-19 pandemic has highlighted the importance of broadband Internet access for businesses as well as for everyday life. However, millions of people and businesses are in areas that conventional fiber-optic cable and wireless networks cannot cost-effectively reach, and as a result, do not have broadband Internet access. The term "digital divide" refers to this gap. In the United States, the digital divide disproportionally impacts those who live in rural areas or who have low incomes.

During the past several years, there has been a rush of companies seeking to address this problem using a very high-tech alternative: creating a network of low earth orbit (LEO) satellites that can beam broadband Internet access to places where it was not previously available. Traditional satellite Internet relies on geostationary (GEO) satellites that orbit over the Earth's equator at a very high altitude and remain at a fixed location relative to the Earth. Traditional satellite Internet service has limitations. For instance, due to the distance that data must travel to the satellite and back, traditional satellite Internet has greater latency, characterized by the lag between when an action is taken and when the result is shown, than other types of broadband Internet service. In addition, weather conditions, such as rain and snow, can cause interruptions in service. Because GEO satellites are located over the equator, they do not provide good service to very northerly or southerly locations. Traditional satellite Internet service is also more costly than other types of broadband service, in terms of both equipment fees and monthly costs.

Unlike GEO satellites, LEO satellite systems orbit at a much lower height (anywhere from about 300 to 1,200 miles above the Earth) and are not restricted to orbiting over the equator. LEO satellite Internet systems rely on a network of satellites, which together provide continuous, uninterrupted coverage, similar to how a cellular network deals with a moving person. LEO satellite systems have several advantages compared to GEO satellite systems. Because they orbit at a much lower height, LEO satellites offer both faster broadband speed and much less latency. They are less likely to be impacted by weather and provide expanded coverage to higher- and lower-latitude areas. They are also eventually expected to be less expensive for consumers. LEO satellite systems are additionally expected to play a significant role in the development of 5G networks by providing redundancy in critical segments and alternatives for connectivity for IoT devices and data traffic.

Elon Musk's SpaceX has thus far taken the lead in LEO satellite Internet. SpaceX's Starlink already has more than 2,200 working satellites in orbit, with more than 400,000 customers in 36 countries. Starlink has a license from the FCC for 12,000 satellites and has filed for permission for an additional 30,000. Starlink currently provides download broadband speeds of more than 100 Mbps and expects to ultimately be able to reach 300 Mbps, a significant advance over traditional satellite Internet speeds, although not as fast as land-based fiber-optic speeds.

Amazon's Project Kuiper, which is expected to launch its first two prototype satellites toward the end of 2022, is positioning itself as a primary competitor to Starlink. Amazon has received FCC approval for more than 3,200 satellites and has applied for permission for an additional 7,700. Amazon has teamed up with

(continued)

(continued)

Verizon to combine Project Kuiper with Verizon's 5G network. Other major companies seeking to establish a LEO footprint in space include British-owned OneWeb, U.S. aircraft manufacturer Boeing, Canadian-owned Telesat, and traditional satellite companies Immarsat, Intelsat, and Hughes. In addition, several Chinese companies have announced plans for their own LEO satellite projects. Low-earth orbit is likely to become a very crowded place!

However, there are a number of issues and concerns about the race to create LEO satellite systems. The sheer number of satellites that potentially may be launched has raised concerns about safety. In 2021, a Chinese spacecraft had to maneuver on two separate occasions to avoid potential collisions with Starlink satellites. LEO systems will add a significant number of objects to the millions of pieces of "space junk" already orbiting Earth, which raises the risk for collisions. Astronomers have also pointed to light pollution of the night sky as a concern, as well as changes to the chemistry of the Earth's upper atmosphere and increased dangers to the Earth's surface from falling space debris.

A related concern is the issue of governance. Although the International Telecommunications Union (ITU) has some overall regulatory authority, individual countries are the ones granting permission for specific systems and they do not necessarily assess global impact. The current regulatory regime, created to govern single satellites, is not well-equipped to handle mega-constellations such as LEO systems.

In addition, the implementation of LEO Internet systems will add a whole new dimension to global Internet infrastructure. Who should govern delivery of Internet services from international space? LEO satellites will be using ground-based infrastructure in different countries, and customers may be anywhere in the world. Which countries' laws will apply, and who can enforce them? For instance, LEO satellite systems will provide new levels of location accuracy. What privacy laws will apply to Internet traffic in space?

Finally, the question remains whether LEO satellite Internet systems can make a real dent in the digital divide. Some question whether they will be able to consistently deliver the performance enhancements in Internet service claimed. Even if they can, these services are meant primarily for sparsely populated regions and will be able to serve only a limited number of customers in high-density areas. And although the costs are lower than traditional satellite Internet, they are still quite high: Starlink currently costs $110 a month, plus a one-time $599 equipment fee, leading many to be concerned that rural and low-income customers will still be priced out.

SOURCES: "SpaceX' Starlink Satellite Internet Surpasses 400,000 Subscribers Globally," by Michael Sheetz, Cnbc.com, May 25, 2022; "SpaceX Passes 2,500 Satellites Launched for Starlink Internet Network," by Stephen Clark, Spaceflightnow.com, May 13, 2022; "Amazon Has Bold Ambitions to Take on SpaceX in the Satellite Internet Business," by Magdalena Petrova, Cnbc.com, May 1, 2022; "Starlink Hits 100+ Mbps Download Speed in 15 Countries during Q4 2021," by Josh Formon, Ookla.com, March 16, 2022; "China's Space Station Has Had to Dodge SpaceX Starlink Satellites Twice," Cnet.com, December 28, 2021; "Internet from Space: How New Satellite Connections Could Affect Global Internet Governance," by Daniel Voelson, Swp-berlin.org, SWP Research Paper 2021/RP 03, December 4, 2021; "Starlink Explained: Everything You Should Know about Elon Musk's Satellite Internet Venture," by Ry Crist, Cnet.com, December 3, 2021; "Satellite Hopes Meet Internet Reality," by Shira Ovide, *New York Times*, November 9, 2021; "In Race to Provide Internet from Space, Companies Ask FCC for About 38,000 New Broadband Satellites, Cnbc.com, November 5, 2021; "Verizon, Amazon to Integrate LEO Satellites with 5G," by Mike Dano, Lightreading.com, October 26, 2021; "The Role of Satellites in 5G Networks," by Melissa Griffith and Christopher Hocking, Wilsoncenter.org, October 1, 2021; "Who Is Starlink Really For?," by Neel Patel, *MIT Technology Review*, September 6, 2021; "Satellite Mega-Constellations Create Risks in Low Earth Orbit, the Atmosphere and on Earth," by Aaron Boley and Michael Byers, *Nature*, May 20, 2021; "The Challenges Satellite Internet Must Address for Take Off," by Marco Hogewoning, Telecoms.com, April 19, 2021; "Will Low-Earth Orbit Satellites Fly Under the Privacy Radar?," by Neil Lappage, Isaca.org, January 4, 2021.

MOBILE INTERNET ACCESS

Fiber-optic networks carry the long-haul bulk traffic of the Internet and play an important role in bringing high-speed broadband to the household and small business. The goal is to bring gigabit and ultimately terabit bandwidth to the household over the next 20 years. But along with fiber optics, arguably the most significant development for the Internet and Web has been the emergence of mobile Internet access.

Wireless Internet is concerned with the last mile of Internet access to the user's home, office, car, smartphone, or tablet computer, anywhere someone is located. Up until 2000, the last-mile access to the Internet—with the exception of a small satellite Internet-connected population—was bound up in land lines of some sort: copper coaxial TV cables or telephone lines or, in some cases, fiber-optic lines to the office. Today, in comparison, high-speed cellphone networks and Wi-Fi network hotspots provide a major alternative.

Today, sales of desktop computers have been eclipsed by sales of smartphones and tablets and ultralight laptop computers with built-in wireless networking functionality. The Internet is now a predominantly mobile, access-anywhere broadband service for the delivery of video, music, and other forms of online content. According to Insider Intelligence/eMarketer, there are almost 280 million mobile Internet users in the United States in 2022 (about 83% of the population) and around 4 billion worldwide (Insider Intelligence/eMarketer, 2022f, 2022g).

Telephone-based versus Computer Network-based Wireless Internet Access

There are two different basic types of wireless Internet connectivity: telephone-based and computer network–based systems.

Telephone-based wireless Internet access connects the user to a global telephone system (land, satellite, and microwave) that has a long history of dealing with millions of users simultaneously and already has in place a large-scale-transaction billing system and related infrastructure. Cellular telephones and the telephone industry are currently the largest providers of wireless access to the Internet today. Smartphones combine the functionality of a cellphone with that of a laptop computer with Wi-Fi capability. Tablet computers can also access cellular networks. **Table 3.9** summarizes the various telephone technologies currently being used and under development for wireless Internet access. 5G wireless is the next frontier.

5G enables high-bandwidth mobile broadband with speeds reaching 10 Gbps or more, and provides support for up to 100,000 connections per square kilometer (known as massive machine-to-machine (M2M) connections), and ultra-low-latency (less than 10 milliseconds) communications. 5G utilizes a new part of the wireless spectrum (shorter millimeter waves in the 30 GHz to 300 GHz range) and requires the development of a transmission infrastructure involving tens of thousands of small-cell and distributed antenna systems installed on utility poles, as well as additional investments in fiber-optic networks. U.S. telecommunications companies initially began to launch 5G networks in 2019, and by the summer of 2022, the major U.S. carriers (AT&T,

5G
cellular standard for high-bandwidth mobile broadband

TABLE 3.9 TELEPHONE-BASED WIRELESS INTERNET ACCESS TECHNOLOGIES

TECHNOLOGY	SPEED	DESCRIPTION
3G (Third Generation)	144 Kbps–2 Mbps	Enabled mobile browsing, e-mail, and instant messaging. Much slower than current technologies. U.S. cellular carriers will begin to shut down their legacy 3G networks in 2022 to free wireless spectrum space for 5G.
4G (Fourth Generation)	Up to 100 Mbps	True broadband on cellphone; lower latency than previous generations.
5G (Fifth Generation)	Up to 10 Gbps	Goals include 1–10 Gbps connectivity and sub-10-millisecond latency. Is expected to enable and/or enhance services such as autonomous driving, augmented reality, virtual reality, and the metaverse.

Verizon, and T-Mobile) were advertising nationwide service. However, full deployment is expected to take a number of years.

Fully functional 5G networks are expected to enable a number of innovative products and services—such as interactive, rich media applications; a new generation of smart wearables; and autonomous and remote-controlled devices—that will be able to take advantage of 5G's higher throughput and lower latency. In the near-term, 5G applications in the online retail industry are likely to be oriented around bandwidth-intensive applications such as livestreaming, augmented reality and virtual reality applications, as well as contactless payment solutions. Similarly, 5G is expected to enhance the production and delivery of "supercharged" online content as well as how that content can be experienced, ultimately enabling a more personalized user experience. Over time, 5G networks, coupled with other technologies such as cloud computing, edge computing, and artificial intelligence, could transform IoT devices into interactive portals for media and communication, leading to the development of an IoT "mediaverse." 5G is also expected to have a transformative impact on digital marketing and advertising, enabling advertisers to target 5G users with higher-resolution mobile video and rich media ads that load almost instantly, as well as ads that incorporate augmented and virtual reality. Ultimately, the combination of 5G, edge/cloud computing, artificial intelligence, and predictive analytics could make digital advertising more interactive and personal.

Wireless local area network (WLAN)-based Internet access derives from a completely different background than telephone-based wireless Internet access. WLANs are based on local area networks where the task is to connect client devices (generally stationary) to server computers within local areas of, say, a few hundred meters. WLANs function by broadcasting radio signals over the airwaves using certain radio frequency ranges, depending on the type of standard involved. The major technologies here are the various versions of the **Wi-Fi** standard, WiMax, and Bluetooth (see **Table 3.10**).

Wi-Fi
wireless standard for local area networks

TABLE 3.10 NETWORK-BASED WIRELESS INTERNET ACCESS TECHNOLOGIES

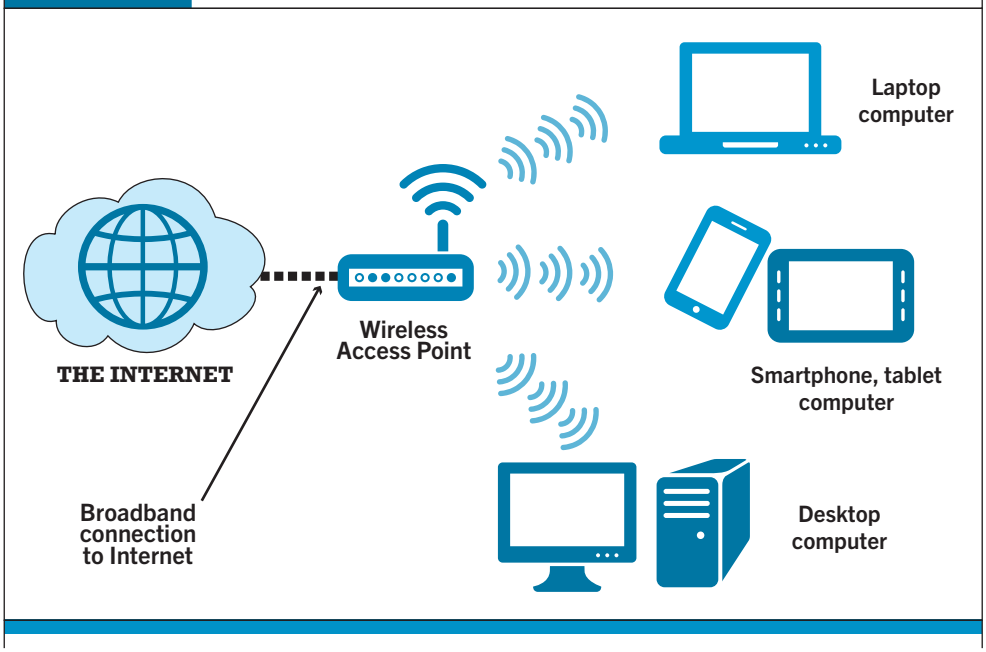
TECHNOLOGY	RANGE/SPEED	DESCRIPTION
Wi-Fi (IEEE 802.11 a/b/g)	35–140 meters/11–54 Mbps	Early high-speed, fixed broadband wireless local area network standards for commercial and residential use
802.11n (Wi-Fi 4)	70–250 meters/up to 288 Mbps	Used multiple antennas to increase throughput and range
802.11ac (Wi-Fi 5)	35 meters/500 Mbps–1 Gbps	Enhanced version of 802.11n/ Wi-Fi 4 that provides higher throughput
802.11ax (Wi-Fi 6)	35 meters/up to 10 Gbps	Successor to 802.11ac/Wi-Fi 5 operates over a greater range of frequencies and with higher throughput
802.11ad (WiGig)	less than 10 meters/up to 7 Gbps	High-speed, short-range Wi-Fi
WiMax (IEEE 802.16)	30 miles/50–70 Mbps	High-speed, medium-range, broadband wireless metropolitan area network
Bluetooth (wireless personal area network)	1–30 meters/1–3 Mbps	Modest-speed, low-power, short-range connection of digital devices

In a Wi-Fi network, a wireless access point (also known as a "hotspot") connects to the Internet directly via a broadband connection (cable, DSL, telephone, or T1 line) and then transmits a radio signal to a transmitter/receiver installed in a tablet or laptop computer or smartphone. **Figure 3.12** illustrates how a Wi-Fi network works.

Wi-Fi provided under various IEEE 802.11 a/b/g/n specifications offers high-bandwidth capacity, from 11 Mbps up to a theoretical maximum of 10 Gbps—far greater than any cellular service currently in existence—but has a relatively limited range, with the exception of WiMax. Wi-Fi is also exceptionally inexpensive. The cost of creating a corporate Wi-Fi network in a single 14-story building with an access point for each floor is less than $100 an access point. It would cost more than $500,000 to wire the same building with Ethernet cable.

IEEE 802.11ac (retroactively labeled by the Wi-Fi Alliance, a nonprofit organization that promotes Wi-Fi technology and certifies Wi-Fi products, as Wi-Fi 5) provides for effective throughputs of 500 Mbps to 1 Gbps. It enables high-definition video streaming and other applications that require high throughput. IEEE 802.11ax (labeled Wi-Fi 6 by the Wi-Fi Alliance and also sometimes referred to as High-Efficiency Wireless [HEW]) is the successor to 802.11ac/Wi-Fi 5 and can operate over a broader range of frequencies and achieve theoretical throughput of up to 10 Gbps. It is also designed to be more effective in dense user environments. IEEE 802.11ad, sometimes referred to as WiGig or short-range Wi-Fi, uses 60 GHz wireless and provides for theoretical maximum throughput of up to 7 Gbps. IEEE 802.11ay is a follow-on to 802.11ad that also uses

FIGURE 3.12 WI-FI NETWORKS



In a Wi-Fi network, wireless access points connect to the Internet using a land-based broadband connection. Clients, which could be desktops, laptops, tablet computers, or smartphones, connect to the access point using radio signals.

60 GHz wireless but provides an extended range of up to 300 – 500 meters and for data rates of up to 20–40 Gbps. IEEE 802.11ah, another relatively new standard (sometimes referred to as HaLow), is aimed at the Internet of Things. IEEE 802.11af (sometimes referred to as White-Fi or Super Wi-Fi) is a Wi-Fi variant designed to use parts of the spectrum left underutilized when television broadcasting switched from analog to digital.

While initially a grassroots public access technology, billions of dollars have subsequently been poured into private ventures seeking to create for-profit Wi-Fi networks. One of the most prominent networks has been created by Boingo Wireless, with more than 1 million hotspots around the globe. Optimum Wi-Fi (available to Optimum Online customers for free) also offers more than 2 million hotspots around the world. AT&T Wi-Fi Services has another large network that provides Wi-Fi service, with thousands of hotspots throughout the United States. T-Mobile also has nationwide Wi-Fi services at Starbucks coffee shops and thousands of other public locations. Apple, in turn, has made Wi-Fi automatically available to iPhone and iPad devices as an alternative to the more expensive and much slower cellular systems.

Bluetooth technology standard for short-range wireless communication under 30 feet

A second WLAN technology for connecting to the Internet, and for connecting Internet devices to one another, is called Bluetooth. **Bluetooth** is a personal connectivity technology that enables links between mobile devices and connectivity to the Internet (Bluetooth SIG Inc., 2022). Bluetooth operates in the 2.4 GHz spectrum but with a very limited range. It uses a frequency-hopping signal with up to 1,600 hops per second over 79 frequencies, giving it good protection from interference and interception.

Bluetooth-equipped devices constantly scan their environments looking for connections to compatible devices. Today, almost all mobile devices are Bluetooth-enabled. The Bluetooth Low Energy (BLE) specification is designed to reduce the energy usage of Bluetooth peripherals. Bluetooth 5.0 extends the ability to use BLE to a variety of devices, such as wireless headphones. Bluetooth 5.0 also extends the range (up to 240 meters) over which devices can communicate, as well as data transfer speeds (up to 2 Mbps) (Bluetooth SIG Inc., 2022).

THE INTERNET OF THINGS

Internet of Things (IoT)
use of the Internet to connect a wide variety of devices, machines, and sensors

No discussion of the Internet would be complete without mentioning the **Internet of Things (IoT)**. Internet technology is spreading beyond the desktop, laptop, and tablet computer, and smartphone to consumer electronics, electrical appliances, cars, medical devices, utility systems, machines of all types, even clothing—just about anything that can be equipped with sensors that can collect data and connect to the Internet, enabling the data to be analyzed with data analytics software. Experts estimate that, as of 2022, there are about 15 billion IoT devices installed (not including smartphones, tablets, or desktop computers), with companies expected to spend $1.2 trillion on IoT technologies (Watters, 2022; IDC, 2021).

IoT builds on a foundation of existing technologies, such as radio frequency identification (RFID) tags, and is being enabled by the availability of low-cost sensors, the drop in price of data storage, the development of big data analytics software that can work with trillions of pieces of data, as well as implementation of IPv6, which will allow Internet addresses to be assigned to all of these new devices. Although IoT devices don't necessarily have to be wireless, most use the wireless communications technology previously discussed, such as cellular networks, Wi-Fi, Bluetooth, or other wireless protocols such as ZigBee or Z-Wave, to connect either directly or via a mobile app to the Internet (often a cloud service).

IoT technology is powering the development of "smart" connected "things"— televisions, houses, and cars, as well as wearable technology—clothing and devices like the Apple Watch. Internet-connected television devices, such as smart televisions, streaming media players, and video game consoles that actively deliver Internet connectivity to the television screen, have become very popular, with more than 80% of households with televisions in the United States having at least one connected TV device and with a mean of more than four such devices per household (Leichtman Research Group, 2021). Smart houses have attracted even more interest. For instance, Google's Nest Labs makes smart thermostats, home security devices, and smoke and carbon monoxide alarms. Google Nest Audio, a digital speaker that works with Google Assistant, which is Google's intelligent digital voice assistant, is also part of Google's smart home strategy. Apple has a similar smart home platform that it calls HomeKit. HomeKit is a framework and network protocol for controlling devices in the home that is programmed directly into Apple's iOS software for iPhones and iPads and is integrated with Siri, Apple's voice-activated artificial intelligence assistant. A number of devices are designed specifically for use with HomeKit, such as a smart thermostat; a smart deadbolt lock; a home sensor that provides temperature, humidity, and air-quality readings; and an iDevices switch that enables the homeowner to turn electronic devices on and off using Siri, as well as Apple's

smart speaker, HomePod. Many cable companies such as Charter Spectrum, Comcast, and AT&T also offer connected home systems that include appliances and lights. All in all, the global market for smart house products is expected to grow from about $85 billion in 2021 to about $140 billion by 2026 (MarketsandMarkets, 2021).

In 2014, Apple introduced the Apple Watch. The Apple Watch features a fitness/activity tracker similar to offerings from Fitbit, is able to access a wide variety of apps, and also works with Apple Pay, Apple's mobile payment service. A number of other manufacturers, such as Samsung, Garmin, and Fossil, have also introduced smartwatches. Consumers worldwide are expected to spend almost $95 billion on wearable devices in 2022 (Insider Intelligence/eMarketer, 2022h).

Connected cars that have built-in Internet access have also arrived (see the opening case, *Connected Cars: The Next Big E-commerce Platform?* in Chapter 2). Here too, Google and Apple are major players. Google has developed Android Auto, a smartphone-based car interface, as well as Android Automotive, a version of its Android operating system designed specifically for cars. Apple has developed CarPlay, a software platform that synchronizes iPhones to the car's infotainment system. Connected cars are likely to be integrated with smart home initiatives in the future. The next frontier on the connected car front is the self-driving car, combining IoT and artificial intelligence technologies. Internet technology companies such as Google and Apple have jumped into the fray alongside automotive companies such as Tesla, BMW, Volvo, GM, Ford, and others.

Despite all of the IoT activity, however, interoperability remains a major concern. The Open Connectivity Foundation is an industry organization that is hoping to create open-source standards for IoT that promote interoperability. A different group, the Industry IoT Consortium, has been formed by AT&T, Cisco, GE, IBM, and Intel to focus on engineering standards for industrial assets. In the smart home arena, the Connectivity Standards Alliance, with participation from more than 200 companies including Google/Nest, Apple, Amazon, and Samsung, is developing a smart home interoperability standard named Matter, which is expected to be launched by the end of 2022. Matter-compliant devices will be able to communicate with one another even if they are from different manufacturers (Open Connectivity Foundation, 2022; Industry IoT Consortium, 2022; Connectivity Standards Alliance, 2022; Tibken, 2022).

Other concerns include security and privacy. Security experts believe that IoT devices could potentially be a security disaster, with the potential for malware being spread throughout a connected network, and difficulty in issuing patches to devices, leaving them vulnerable. Data from stand-alone smart devices can reveal much personal detail about a consumer's life, and if those devices are all ultimately interconnected, there will be little that is truly private. We examine the security concerns associated with IoT devices further in Chapter 5.

WHO GOVERNS THE INTERNET?

Many people believe that the Internet is not governed by any organization or government and, indeed, cannot be governed—that it is inherently above and beyond the law. What these people forget is that the Internet runs over private and public telecommunications facilities that are themselves governed by laws and subject to the same pressures as all telecommunications carriers. In fact, the Internet is tied into a complex web

of governing bodies, national governments, and international professional societies. There is no one, single governing organization that controls activity on the Internet. Instead, there are a number of organizations that influence the system and monitor its operations. Among the governing bodies of the Internet are:

- The *Internet Corporation for Assigned Names and Numbers (ICANN),* which coordinates the Internet's systems of unique identifiers: IP addresses, protocol parameter registries, and the top-level domain systems. ICANN was created in 1998 as a nonprofit organization and manages the Internet Assigned Numbers Authority (IANA), which is in charge of assigning IP addresses.
- The *Internet Engineering Task Force (IETF),* which is an open international community of network operators, vendors, and researchers concerned with the evolution of the Internet architecture and operation of the Internet. The IETF has a number of working groups, organized into several different areas, that develop and promote Internet standards, which influence the way people use and manage the Internet.
- The *Internet Research Task Force (IRTF),* which focuses on the evolution of the Internet. The IRTF has a number of long-term research groups working on various topics such as Internet protocols, applications, and technology.
- The *Internet Engineering Steering Group (IESG),* which is responsible for technical management of IETF activities and the Internet standards process.
- The *Internet Architecture Board (IAB),* which helps define the overall architecture of the Internet and oversees the IETF and IRTF.
- The *Internet Society (ISOC),* which is a consortium of corporations, government agencies, and nonprofit organizations that monitors Internet policies and practices.
- The *Internet Governance Forum (IGF),* which is a multi-stakeholder, open forum for debate on issues related to Internet governance.
- The *World Wide Web Consortium (W3C),* which is a largely academic group that sets HTML and other programming standards for the Web.
- The *Internet Network Operators Groups (NOGs),* which are informal groups that are made up of ISPs, IXPs, and others that discuss and attempt to influence matters related to Internet operations and regulation.

While none of these organizations has actual control over the Internet and how it functions, they can and do influence government agencies, major network owners, ISPs, corporations, and software developers with the goal of keeping the Internet operating as efficiently as possible. ICANN comes closest to being a manager of the Internet.

In addition to these professional bodies, the Internet must also conform to the laws of the sovereign nation-states in which it operates as well as to the technical infrastructures that exist within each nation-state. Although in the early years of the Internet there was very little governmental interference, this situation is changing as the Internet plays a growing role in the distribution of information and knowledge, including content that some find objectionable.

Read *Insight on Society: Government Regulation and Surveillance of the Internet* for a further look at the issue of government regulation and surveillance of content on the Internet.

INSIGHT ON SOCIETY

GOVERNMENT REGULATION AND SURVEILLANCE OF THE INTERNET

In the early years of the Internet and the Web, many people assumed that because the Internet is so widely dispersed, it would be impossible to control or monitor it. But the reality is quite different. All governments assert some kind of control over and surveillance of Internet content, and in many nations this control and surveillance is very extensive.

While the Internet is a decentralized network, in many countries Internet traffic runs through fiber-optic trunk lines that are controlled by national authorities. For example, China requires the three state-run telecommunications companies that operate those lines to configure their routers to enable examination of both internal and external service requests. When a request originates in China for a web page that is part of a website hosted on a server located outside of China, Chinese routers first examine the request to see if the site is on a prohibited list and then examine the requested web page to see if it contains prohibited terms. For example, a Wikipedia article on Internet censorship in China was blocked because it contained the words "Internet censorship." China now completely blocks access to all Wikipedia websites in all languages. The system is often referred to as "The Great Firewall of China" (but by China as the "Golden Shield") and was implemented with the assistance of a number of U.S. technology firms such as Cisco (the largest manufacturer of routers in the world), Juniper Networks, and Blue Coat Systems (which provided deep packet-inspection software), among others.

Over the last several years, China has strengthened and extended its regulation of the Internet and has been identified as the world's worst abuser of Internet freedom for seven years in a row by Freedom House, an Internet watchdog organization. For instance, in 2021, new restrictions on user-generated content took effect, requiring administrators of independently operated social media accounts to obtain a permit and refrain from commenting on certain topics. During 2021, China also blocked the usage of a number of mobile apps, such as the encrypted communication platform Signal and Clubhouse, an audio-based social network app, further restricting Chinese users' ability to communicate with people outside of China. China had previously blocked WhatsApp, Facebook, Twitter, Instagram, Telegram, Snapchat, and Skype. In 2022, China instituted a new policy of displaying social media users' locations beneath their posts, making it easier for such posters to be targeted and possibly harassed based on whether they are posting from overseas.

China is often criticized for its extensive Internet controls, but other countries have similar policies. Iran's Internet surveillance of its citizens is considered by security experts to be one of the world's most sophisticated mechanisms for controlling and censoring the Internet, allowing Iran to examine the content of individual online communications on a massive scale. The Iranian system goes beyond merely preventing access to specific sites and mobile apps. The government also uses deep packet inspection to read messages, alter their contents for disinformation purposes, and identify senders and recipients. Computers installed in the line between users and ISPs open up every digitized packet, looking for certain keywords and images, reconstructing the message, and then sending it on. Iran is establishing an isolated, domestic version of the Internet that it calls the National Information Network (NIN), one that purportedly is faster and

less costly but that controls what users can and cannot see and subjects its users to even more heightened surveillance. In 2020, Iran's top Internet policymaking body set five-year targets for the expansion of the NIN. The development of the NIN and Iran's control over the Internet backbone within Iran has allowed the Iranian government to shut the Internet down in particular areas or throttle global Internet connection speeds during politically sensitive time periods.

Russia also has numerous rules regulating operation of the Internet in Russia to control online speech. Similar to China, Russia has a law requiring Internet companies to store their data on Russian soil, as well as additional laws that require mandatory data retention by ISPs and telecommunications providers for between six months and three years, access to all such data without a warrant, and the creation of a government backdoor that will enable it to access all encrypted communications. Russia also bans the use of VPNs and anonymizers, tools that can be used to establish a secure and anonymous connection to the Internet. A law passed in 2019 requires telecommunications companies and ISPs to install equipment using deep packet inspection technology that gives Russia the power to block, filter, and slow down websites it does not want the Russian public to see. As of October 2020, the technology covered 100% of mobile Internet traffic and more than 70% of broadband traffic. The law also created a registry of transnational Internet cables entering the country and Internet Exchange Points, which makes it easier for Russia to shut down part of the network. Russia's invasion of Ukraine in 2022 has been accompanied by a major clampdown on access to the global Internet within Russia, creating a walled-off Internet similar to China's and Iran's. Websites blocked in Russia since the war began include Facebook, Instagram, Twitter, Google News, BBC News, NPR, and many others. Many Internet companies are withdrawing their services from Russia. However, at the same time, there has been a surge in downloads of virtual private network apps, which enable Russians to access those blocked sites despite Russian laws that have banned many VPN providers.

But it is not just totalitarian nations that have sought to regulate and surveil the Internet. Both Europe and the United States have, at various times, also taken steps to control access to certain websites, censor web content, and engage in extensive surveillance of communications. For instance, Great Britain has a list of blocked sites, as do Germany, France, and Australia. Even in South Korea, one of the world's most wired countries, there are restrictions on content that is deemed subversive and harmful to the public order. In response to terrorism threats and other crimes, European governments and the U.S. government also perform deep packet inspection on e-mail and text communications of terrorist suspects. This surveillance is not limited to cross-border international data flows; it also includes large-scale domestic surveillance and analysis of routine e-mails, tweets, and other messages. As tensions among world powers continue to simmer, governments are likely to double down on their control of the content that passes across their online borders.

SOURCES: "China's Internet Censors Try a New Trick: Revealing Users' Locations," by Joy Dong, *New York Times*, May 18, 2022; "How Millions of Russians Are Tearing Holes in the Digital Iron Curtain," by Anthony Faiola, *Washington Post*, May 6, 2022; "How the Great Firewall of China Affects Performance of Websites Outside of China," by Matt Schmitz, Dotcom-monitor.com, March 27, 2022; "Russia, Blocked from the Global Internet, Plunges into Digital Isolation," by Adam Satariano and Valerie Hopkins, *New York Times*, March 7, 2022; "Freedom on the Net 2021: The Global Drive to Control Big Tech," by Freedom House, Freedomhouse.org, September 21, 2021, "Russia Is Censoring the Internet, with Coercion and Black Boxes," by Adam Satariano and Paul Mozer, *New York Times*, October 22, 2021; "How the Iranian Government Shut Off the Internet," by Lily Hay Newman, Wired.com, November 17, 2019; "China's Global Reach: Surveillance and Censorship Beyond the Great Firewall," by Danny O'Brien, Eff.org, October 10, 2019; "China Presses Its Internet Censorship Efforts Across the Globe," by Paul Mozur, *New York Times*, March 2, 2018; "Microsoft's Skype Pulled from Apple, Android China App Stores," by Keith Bradsher and Cate Cadell, Reuters.com, November 21, 2017; "China Blocks WhatsApp, Broadening Online Censorship," *New York Times*, September 25, 2017; "After Terror Attacks, Britain Moves to Police the Web," by Mark Scott, *New York Times*, June 19, 2017.

3.3 THE WEB

Without the Web, there would be no e-commerce. The invention of the Web brought an extraordinary expansion of digital services including color text and pages, formatted text, pictures, animations, video, and sound. In short, the Web makes nearly all the rich elements of human expression needed to establish a commercial marketplace available to nontechnical computer users worldwide.

While the Internet was born in the 1960s, the Web was not invented until 1989–1991 by Dr. Tim Berners-Lee of the European Particle Physics Laboratory, better known as CERN (Berners-Lee et al., 1994). Several earlier authors—such as Vannevar Bush (in 1945) and Ted Nelson (in the 1960s)—had suggested the possibility of organizing knowledge as a set of interconnected pages that users could freely browse (Bush, 1945; Ziff Davis Publishing, 1998). Berners-Lee and his associates at CERN built on these ideas and developed the initial versions of HTML, HTTP, a web server, and a browser, the four essential components of the Web.

First, Berners-Lee wrote a computer program that allowed formatted pages within his own computer to be linked using keywords (hyperlinks). Clicking on a keyword in a document would immediately move him to another document. Berners-Lee created the pages using a modified version of a powerful text markup language called Standard Generalized Markup Language (SGML).

Berners-Lee called this language HyperText Markup Language, or HTML. He then came up with the idea of storing his HTML pages on the Internet. Remote client computers could access these pages by using HTTP (introduced earlier, in Section 3.1, and described more fully in the next section). But these early web pages still appeared as black-and-white text pages with hyperlinks expressed inside brackets. The early Web was based on text only; the original web browser provided only a line interface.

Information shared on the Web remained text-based until 1993, when Marc Andreessen and others at the National Center for Supercomputing Applications (NCSA) at the University of Illinois created a web browser with a graphical user interface (GUI) called **Mosaic** that made it possible to view documents on the Web graphically, using colored backgrounds, images, and even primitive animations. Mosaic was a software program that could run on any graphically based interface such as Macintosh, Windows, or Unix. The Mosaic browser software read the HTML text on a web page and displayed it as a graphical interface document within a GUI operating system such as Windows or Macintosh. Liberated from simple black-and-white text pages, HTML pages could now be viewed by anyone in the world who could operate a mouse and use a Macintosh or a PC.

Mosaic
web browser with a graphical user interface (GUI) that made it possible to view documents on the Web graphically

Aside from making the content of web pages colorful and available to the world's population, the graphical web browser created the possibility of **universal computing**, the sharing of files, information, graphics, sound, video, and other objects across all computer platforms in the world, regardless of operating system. A browser could be made for each of the major operating systems, and the web pages created for one system, say, Windows, would also be displayed exactly the same, or nearly the same, on computers running the Macintosh or Unix operating systems. As long as each operating system had a Mosaic browser, the same web pages could be used on all the different types of computers and operating systems. This meant that no matter what kind of computer you used, anywhere

universal computing
the sharing of files, information, graphics, sound, video, and other objects across all computer platforms in the world, regardless of operating system

in the world, you would see the same web pages. The browser and the Web have introduced us to a whole new world of computing and information management that was unthinkable prior to 1993.

In 1994, Andreessen and Jim Clark founded Netscape, which created the first commercial browser, **Netscape Navigator**. Although Mosaic had been distributed free of charge, Netscape initially charged for its software. In 1995, Microsoft Corporation released its own free version of a browser, called **Internet Explorer**. In the ensuing years, Netscape fell from a 100% market share to less than 0.5% in 2009. The fate of Netscape illustrates an important e-commerce business lesson: Innovators often are not long-term winners, whereas smart followers may have the assets needed for long-term survival. Much of the Netscape browser code survives today in the Firefox browser produced by the Mozilla Foundation, a nonprofit organization dedicated to Internet openness.

Netscape Navigator
the first commercial web browser

Internet Explorer
Microsoft's original web browser

HYPERTEXT

Web pages can be accessed through the Internet because web browser software can request web pages stored on an Internet host server using the HTTP or HTTPS (a more secure version of HTTP that most websites now use) protocol. **Hypertext** is a way of formatting pages with embedded links that connect documents to one another and that also link pages to other objects such as sound, video, or animation files. When you click on a graphic and a video clip plays, you have clicked on a hyperlink. For example, when you type a web address in your browser such as https://www.sec.gov, your browser sends an HTTP request to the sec.gov server requesting the home page of sec.gov.

hypertext
a way of formatting pages with embedded links that connect documents to one another and that also link pages to other objects such as sound, video, or animation files

HTTP (or HTTPS) is the first set of letters at the start of every web address, followed by the domain name. The domain name specifies the organization's server computer that is housing the document. Most companies have a domain name that is the same as or closely related to their official corporate name. The directory path and document name are two more pieces of information within the web address that help the browser track down the requested page. Together, the address is called a Uniform Resource Locator, or URL. When typed into a browser, a URL tells the browser exactly where to look for the information. For example, in the following example URL:

https://www.megacorp.com/content/features/082602.html

https = the protocol used to display web pages

www.megacorp.com = domain name

content/features = the directory path that identifies where on the domain web server the page is stored

082602.html = the document name and its format (an HTML page)

The most common domain extensions (known as general top-level domains, or gTLDs) include the familiar .com domain (originally intended for commercial organizations, but available for any use), .net (any use); .edu (educational institutions), and .gov (governmental organizations), among others. As of the end of 2021, there were 160 million .com domains in the domain name base. Countries also have domain names, such as .uk, .au, and .br (United Kingdom, Australia, and Brazil, respectively). These are sometimes referred to as country-code top-level domains, or ccTLDs. As of

the end of 2021, there were 127 million total ccTLD domains. In 2011, ICANN removed nearly all restrictions on domain names, thereby greatly expanding the number of different domain names available. New gTLDs can be in multiple languages and scripts/characters (including Arabic, Chinese, Japanese, and Russian) and can include geographic placenames such as .nyc, .london, and .paris; business identifiers such as .restaurant, .realtor, .technology, and .lawyer; brand names such as .bmw and .suzuki; and a whole host of other descriptive names. As of the end of 2021, there were almost 25 million domain registrations using those new gTLDs (Verisign, 2022).

MARKUP LANGUAGES

Although the most common web page formatting language is HTML, the concept behind document formatting actually had its roots in the 1960s with the development of Generalized Markup Language (GML).

HyperText Markup Language (HTML)

HyperText Markup Language (HTML)
GML that provides web page designers with a fixed set of markup "tags" that are used to format a web page

HyperText Markup Language (HTML) is a GML that is relatively easy to use. HTML provides web page designers with a fixed set of markup "tags" that are used to format a web page. When these tags are inserted into a web page, they are read by the browser and interpreted into a page display. All web browsers allow you to view the source HTML code for a web page, with the particular method depending on the web browser being used. For instance, if you are using the Firefox web browser, all you need to do is press the Control key on the keyboard at the same time as pressing the U key. In **Figure 3.13**, the HTML code in the first screen produces the display in the second screen.

Cascading Style Sheets (CSS)
tell a web browser how to display the HTML elements on the screen

HTML defines the structure of a document, including the headings, graphic positioning, tables, and text formatting. HTML is used in conjunction with **Cascading Style Sheets (CSS)**, which tell a web browser how to display the HTML elements on the screen. HTML provides the structure of the page, while CSS provides the style. HTML web pages can be created with any text editor, such as Notepad or WordPad, using Microsoft Word (simply save the Word document as a web page), or any one of several web page development tools such as Microsoft Visual Studio or Adobe Dreamweaver CC.

HTML5
most recent version of HTML

The most recent version of HTML is **HTML5**. HTML5 has become the de facto web page development standard, providing functionality that in the past was provided by plug-ins such as Adobe Flash. HTML5 enables not only video but also animations and interactivity with the assistance of CSS3 (the latest version of CSS), JavaScript, and HTML5 Canvas, an element used to draw graphics using JavaScript. HTML5 is also used in the development of mobile websites and mobile apps and is an important tool in both responsive web design and adaptive web delivery, all of which are discussed more fully in Chapter 4. HTML5 apps work just like web pages, with page content, including graphics, images, and video, loaded into the browser from a web server rather than residing in the mobile device hardware. This device-independence has been embraced by mobile developers. HTML5 can also access built-in features of mobile devices, like GPS and swiping. The rise of HTML5 as the preferred media delivery platform for the Web has mirrored the growth of the mobile platform and hastened the demise of Adobe Flash, which was developed for the desktop.

FIGURE 3.13 EXAMPLE HTML CODE (A) AND WEB PAGE (B)

(A)

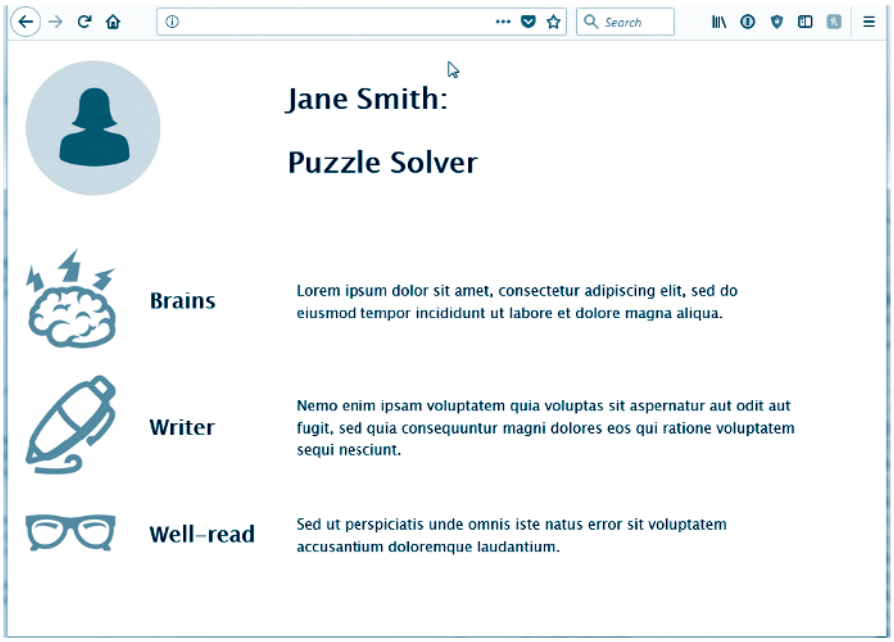
```
index2.html - Notepad
File Edit Format View Help
<!doctype html>
<html>
<head>
<meta charset="utf-8">
<title>css</title>
<style type="text/css">
body,td,th {
        color: #000000;
        font-family: "Lucida Grande", "Lucida Sans Unicode", "Lucida Sans", "DejaVu Sans", Verdana, sans-serif;
        font-size: 16px;
}
</style>
</head>

<body>
<table width="881" border="0" cellpadding="10">
  <tbody>
    <tr>
      <td width="269"><img src="profile.png" width="150" height="151" /></td>
      <td width="566"><h1>Jane Smith: </h1>
      <h1>Puzzle Solver</h1></td>
    </tr>
  </tbody>
</table>
<br>

<table width="881" border="0" cellpadding="10">
  <tbody>
    <tr>
      <td width="120"><img src="brain.png" width="100" height="112" /></td>
       <td width="160"><h2>Brains</h2></td>
     <td width="677"><p>Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt
ut labore et dolore magna aliqua. </p>
     </td></tr>
    <tr>
      <td><img src="pen.png" width="100" height="112" ></td>
                <td><h2>Writer</h2></td><td>Nemo enim ipsam voluptatem quia voluptas sit aspernatur aut odit aut
fugit, sed quia consequuntur magni dolores eos qui ratione voluptatem sequi nesciunt.</td></tr>
     <tr>
      <td><img src="glasses.png" width="100" height="41" /></td>
        <td><h2>Well-read</h2></td><td>Sed ut perspiciatis unde omnis iste natus error sit voluptatem accusantium
doloremque laudantium. </td></tr>
 </tbody>
</table>

</body>
</html>
```

(B)



HTML is a text markup language used to create web pages. It has a fixed set of "tags" that are used to tell the browser software how to present the content on the screen. The HTML shown in Figure 3.13 (a) creates the web page shown in Figure 3.13 (b).

SOURCE: Used with permission from Microsoft.

FIGURE 3.14 A SAMPLE XML DOCUMENT

```
<?xml version="1.0"?>
<note>
<to>George</to>
<from>Carol</from>
<heading>Just a Reminder</heading>
<body>Don't forget to order the groceries from FreshDirect!</body>
</note>
```

The tags in this sample XML document, such as <note>, <to>, and <from>, are used to describe data and information rather than the look and feel of the document.

eXtensible Markup Language (XML)

eXtensible Markup Language (XML) a markup language specification developed by the World Wide Web Consortium (W3C) that is designed to describe data and information

eXtensible Markup Language (XML) takes web document formatting a giant leap forward. XML is a markup language specification developed by the W3C that is similar to HTML but has a very different purpose: Whereas the purpose of HTML is to control the "look and feel" and display of data on the web page, XML is designed to describe data and information. For example, consider the sample XML document in **Figure 3.14**. The first line in the sample document is the XML declaration, which is always included; it defines the XML version of the document. In this case, the document conforms to the 1.0 specification of XML. The next line defines the first element of the document (the root element): <note>. The next four lines define four child elements of the root (to, from, heading, and body). The last line defines the end of the root element. Notice that XML says nothing about how to display the data or how the text should look on the screen: HTML is used for information display in combination with XML, which is used for data description.

Figure 3.15 shows how XML can be used to define a database of company names in a company directory. Tags such as <Company>, <Name>, and <Specialty> can be defined for a single firm or for an entire industry. On an elementary level, XML is extraordinarily easy to learn and is very similar to HTML except that users can make up their own tags. At a deeper level, XML has a rich syntax and an enormous set of software tools, which make XML ideal for storing and communicating many types of data on the Web.

XML is "extensible," which means the tags used to describe and display data are defined by the user, whereas in HTML the tags are limited and predefined. XML can also transform information into new formats, such as by importing information from a database and displaying it as a table. With XML, information can be analyzed and displayed selectively, making it a more powerful alternative to HTML. This means that business firms, or entire industries, can describe all of their invoices, accounts payable, payroll records, and financial information using a web-compatible markup language. Once described, these business documents can be stored on intranet web servers and shared throughout the corporation.

Really Simple Syndication (RSS) XML format that allows users to have digital content, including text, articles, blogs, and podcast audio files, automatically sent to their computers over the Internet

Really Simple Syndication (RSS) is an XML format that allows users to have digital content, including text, articles, blogs, and podcast audio files, automatically sent to their computers via the Internet. An RSS aggregator software application that you install on your computer gathers material from the websites and blogs that you tell it to scan

FIGURE 3.15 SAMPLE XML CODE FOR A COMPANY DIRECTORY

```
<?xml version="1.0"?>
<Companies>
    <Company>
           <Name>Azimuth Interactive Inc.</Name>
        <Specialties>
                  <Specialty>HTML development</Specialty>
                    <Specialty>technical documentation</Specialty>
                 <Specialty>ROBO Help</Specialty>
                  <Country>United States</Country>
        </Specialties>
       <Location>
                  <Country>United States</Country>
                <State />
                 <City>Chicago</City>
       </Location>
              <Telephone>301-555-1212</Telephone>
    </Company>
    <Company>
       ...
    </Company>
   ...
</Companies>
```

This XML document uses tags to define a database of company names.

and brings new information from those sites to you. Sometimes this is referred to as "syndicated" content because it is distributed by news organizations and other syndicators (or distributors). Users download an RSS aggregator and then "subscribe" to the RSS "feeds." When you go to your RSS aggregator's page, it will display the most recent updates for each channel to which you have subscribed. RSS has evolved from a "techie" pastime to a broad-based movement. Although Google has closed down Google Reader, a popular RSS product, a number of other RSS reader options remain, including Feedly, Reeder, and NewsBlur.

WEB SERVERS AND CLIENTS

We have already described client/server computing and the revolution in computing architecture brought about by client/server computing. You already know that a server is a computer attached to a network that stores files, controls peripheral devices, interfaces with the outside world—including the Internet—and does some processing for other computers on the network.

But what is a web server? **Web server software** refers to the software that enables a computer to deliver web pages written in HTML to clients on a network that request this service by sending an HTTP request. Apache, which works with Linux and Unix operating systems, is the most commonly used type of web server software in terms of number of active websites. Nginx, an open-source web server, also has significant market share (Netcraft, 2022). **Table 3.11** describes the basic capabilities provided by web server software.

web server software software that enables a computer to deliver web pages written in HTML to client computers on a network that requests this service by sending an HTTP request

TABLE 3.11 BASIC FUNCTIONALITY PROVIDED BY WEB SERVER SOFTWARE

FUNCTIONALITY	DESCRIPTION
Processing of HTTP requests	Receive and respond to client requests for HTML pages
Security services (Transport Layer Security [TLS])	Verify user name and password; process certificates and private/public key information required for credit card processing and other secure information
File transfer	Permits transfer of very large files from server to server via protocols such as FTP, FTPS, and SFTP
Search engine	Indexing of site content; keyword search capability
Data capture	Log file of all visits, time, duration, and referral source
E-mail	Ability to send, receive, and store e-mail messages
Site management tools	Calculate and display key site statistics such as unique visitors, page requests, and origin of requests; check links on pages

database server software
software designed to access specific information within a database

ad server software
software designed to deliver targeted ads

mail server software
software that provides e-mail messages

media server software
software that enables streaming and other types of media to be delivered

web client
any computing device attached to the Internet that is capable of making HTTP requests and displaying HTML pages

web browser
software program whose primary purpose is to display web pages

The term *web server* is also used to refer to the physical computer that runs web server software. Leading manufacturers of web server computers include Lenovo, Dell, and HP. Although any desktop computer can run web server software, it is best to use a computer that has been optimized for this purpose.

Aside from the generic web server software packages, there are actually many types of specialized server software packages, from **database server software** designed to access specific information within a database to **ad server software**, which delivers targeted ads; **mail server software**, which provides e-mail messages; and **media server software**, which enables streaming and other types of media to be delivered. For a small e-commerce site, all of these software packages might be running on a single computer with a single processor. For a large corporate site, there may be hundreds or thousands of discrete server computers, many with multiple processors, running specialized web server functions. We discuss the architecture of e-commerce sites in greater detail in Chapter 4.

A **web client** is any computing device, such as Windows or Macintosh desktop/laptop computer, attached to the Internet that is capable of making HTTP requests and displaying HTML pages. However, the most common and fastest-growing category of web clients is not computers at all, but mobile devices. In general, a web client can be any device—including a printer, refrigerator, stove, home lighting system, or automobile instrument panel—capable of sending data to and receiving data from a web server.

WEB BROWSERS

A **web browser** is a software program whose primary purpose is to display web pages. Google's Chrome, a technologically advanced open-source browser, is the leading desktop web browser, with about 60% of the market. Apple's Safari browser is in second place,

with about an 18% share. Microsoft's Edge browser, first released in 2015 as an entirely new browser bundled with its Windows 10 operating system, has taken some time to gain traction but is now in third place, with about a 12% share. Mozilla Foundation's Firefox, a free, open-source web browser based on Mozilla's open-source code (which originally provided the code for Netscape), is in fourth place, with about a 7% share. Apple's Safari browser is the most popular mobile browser, with a market share of almost 55%, due in large part to its use on iPhones and iPads, followed by Google's Chrome, with around 39% (Vailshery, 2022a, 2022b).

3.4 THE INTERNET AND WEB: FEATURES AND SERVICES

The Internet and Web have spawned a number of powerful software applications upon which the foundations of e-commerce are built. You can think of all these applications as web services, and it is interesting as you read along to compare these services to other, traditional media such as television or print media. If you do, you will quickly realize the richness of the Internet environment.

COMMUNICATION TOOLS

The Internet and Web provide a number of communication tools that enable people around the globe to communicate with one another, both on a one-to-one basis as well as on a one-to-many basis. Communication tools include e-mail, messaging applications, online message boards (forums), Internet telephony applications, and video conferencing, video chatting, and telepresence. We'll look at each of these in a bit more depth in the following sections.

E-mail

Since its earliest days, **electronic mail (e-mail)** has been the most-used application of the Internet. Worldwide, there are about 4.2 billion e-mail users (more than half of the world's total population) sending more than 330 billion e-mails a day (Radicati Group, 2021). Estimates vary on the amount of spam, ranging from 40% to 90%. E-mail marketing and spam are examined in more depth in Chapter 6.

E-mail uses a series of protocols to enable messages containing text, images, sound, and video clips to be transferred from one Internet user to another. Because of its flexibility and speed, it is now the most popular form of business communication—more popular than the phone, fax, or snail mail (the U.S. Postal Service). In addition to text typed within the message, e-mail also allows **attachments**, which are files inserted within the e-mail message. The files can be documents, images, sounds, or video clips.

electronic mail (e-mail)
the most-used application of the Internet. Uses a series of protocols to enable messages containing text, images, sound, and video clips to be transferred from one Internet user to another

attachment
a file inserted within an e-mail message

instant messaging (IM)
displays text entered almost instantaneously. Recipients can then respond immediately to the sender the same way, making the communication more like a live conversation than is possible through e-mail

Messaging Applications

Instant messaging (IM) allows you to send messages in real time, unlike e-mail, which has a time lag of several seconds to minutes between when messages are sent and when they are received. IM displays text entered almost instantaneously. Recipients can then respond immediately to the sender the same way, making the communication more like a live conversation than is possible through e-mail. To use IM, users create a list of people

they want to communicate with and then enter short text messages that are delivered instantly to the selected recipient (if they are online at the same time). Although text remains the primary communication mechanism in IM, more advanced systems also provide voice and video chat functionality. Instant messaging over the Internet competes with cellphone Short Message Service (SMS) and Multimedia Messaging Service (MMS) texting. Major IM systems include Skype and Google Chat. (Early leaders AIM [AOL Instant Messenger] and Yahoo Messenger have both been discontinued.) IM systems were initially developed as proprietary systems, with competing firms offering versions that did not work with one another. Today, there still is no built-in interoperability among the major IM systems.

Mobile messaging apps, such as Meta's Messenger, WhatsApp (purchased by Meta for $22 billion in 2014), Snapchat (which allows users to send pictures, videos, and texts that will disappear after a short period of time), Kik, Viber, and others have also become wildly popular, providing competition for both traditional desktop IM systems and SMS text messaging. In the United States in 2022, more than 155 million people (more than 45% of the population) use mobile messaging apps, and companies are increasingly turning their attention to using these apps to market their brands (Insider Intelligence/eMarketer, 2022i).

Online Message Boards

online message board web application that allows Internet users to communicate with each other, although not in real time

An **online message board** (also referred to as a forum, bulletin board, discussion board, discussion group, or simply a board or forum) is a web application that enables Internet users to communicate with each other, although not in real time. A message board provides a container for various discussions (or "threads") started (or "posted") by members of the board and, depending on the permissions granted to board members by the board's administrator, enables a person to start a thread and reply to other people's threads. Most message board software allows more than one message board to be created. The board administrator typically can edit, delete, move, or otherwise modify any thread on the board. Unlike an electronic mailing list (such as a listserv), which automatically sends new messages to a subscriber, an online message board typically requires the member to visit the board to check for new posts. Some boards offer an "e-mail notification" feature that notifies users that a new post of interest to them has been made.

Internet Telephony

IP telephony general term for the technologies that use VoIP and the Internet's packet-switched network to transmit voice and other forms of audio communication over the Internet

Voice over Internet Protocol (VoIP) protocol that allows for transmission of voice and other forms of audio communication over the Internet

If the telephone system were to be built from scratch today, it would be an Internet-based, packet-switched network using TCP/IP because it would be less expensive and more efficient than the alternative, existing system, which involves a mix of circuit-switched legs with a digital backbone. Likewise, if cable television systems were built from scratch today, they most likely would use Internet technologies for the same reasons.

IP telephony is a general term for the technologies that use **Voice over Internet Protocol (VoIP)** and the Internet's packet-switched network to transmit voice, fax, and other forms of audio communication over the Internet. VoIP can be used over a traditional handset as well as over a mobile device. VoIP avoids the long-distance charges imposed by traditional phone companies.

In the past, voice and fax were the exclusive provenance of the regulated telephone networks. With the convergence of the Internet and telephony, however, this dominance

has changed. Telephone providers and cable companies have become ISPs and vice versa. In the United States, almost 60% of all wired phones are now using VoIP, and this number continues to expand as cable systems provide telephone service as part of their "triple play": voice, Internet, and TV as a single package. This number is dwarfed, however, by the number of mobile VoIP subscribers, which has grown explosively over the last several years, fueled by the rampant growth of mobile messaging apps that now also provide free VoIP services, such as Microsoft's Skype, Meta's Messenger and WhatsApp, Viber, WeChat, and others.

Videoconferencing, Video Chatting, and Telepresence

Internet videoconferencing and video chatting is accessible to anyone with a broadband Internet connection and a web camera (webcam). Use of these technologies has surged during the Covid-19 pandemic, as tools both for conducting business remotely and for individuals seeking to connect with family and friends (see the *Insight on Business* case, *Zoom Continues to Zoom*). Popular videoconferencing tools for businesses include Zoom, Webex (owned by Cisco), Microsoft Teams, GoToMeeting, and Fuze. Slack, a cloud-based team collaboration tool that includes videoconferencing and chatting, is another popular option. There are a number of web-based video chatting options geared more toward consumer use, such as Apple's FaceTime, Messenger, Skype, Google Chat, and a freemium version of Zoom.

Telepresence takes videoconferencing up several notches. Rather than people "meeting" by using webcams, telepresence creates an environment in a room using multiple cameras and screens, which surround the users. The experience is uncanny and strange at first because as you look at the people in the screens, they are looking directly at you. Broadcast quality and higher screen resolutions help create that effect. Users have the sensation of "being in the presence of their colleagues" in a way that is not true for traditional webcam meetings. Providers of telepresence software and hardware include Cisco, LifeSize, BlueJeans (owned by Verizon), and Polycom.

SEARCH ENGINES

search engine identifies web pages that appear to match keywords, also called queries, entered by the user and then provides a list of the best matches

Search engines identify web pages that appear to match keywords, also called queries, entered by a user and then provide a list of the best matches (search results). More than 85% of U.S. Internet users regularly use search engines from either desktop or mobile devices, and they generate around 22 billion queries a month on desktop computers, about 12.7 billion of which are conducted using Google. Desktop search volume is declining, as more and more search activity moves to mobile devices. In fact, Google reported that mobile search queries exceeded desktop queries in the United States and numerous other countries for the first time in 2015. There are hundreds of different search engines, but the vast majority of the search results are supplied by the top two providers: Google and Microsoft's Bing. Google currently has about 62% of the desktop search market, based on number of searches, followed by Bing, with about 27%; Google dominates the mobile search market, with an almost 94% share (Insider Intelligence/eMarketer, 2022j; Comscore, Inc., 2022a, 2022b; Johnson, 2022).

Web search engines started out in the early 1990s, shortly after Netscape released the first commercial web browser. Early search engines were relatively simple software

INSIGHT ON BUSINESS

ZOOM CONTINUES TO ZOOM

Prior to 2020, videoconferencing was a tool primarily used by businesses to conduct remote meetings, and video chatting was a fun way to connect with family and friends. Then the Covid-19 pandemic happened. Suddenly, videoconferencing became critical infrastructure and video chatting a lifeline for the socially isolated. The trend has continued in 2022, even as life slowly returns to a "new normal." Working remotely remains commonplace. As a result, companies that provide these services have seen a huge surge in demand. Foremost among them is Zoom, which had already been gaining traction against the videoconferencing options offered by companies such as Skype (owned by Microsoft), Google Chat, and Cisco's Webex. Zoom has skyrocketed in popularity but at the same time faces serious challenges based on concerns about its security and privacy policies.

Zoom was founded in 2011 by Webex and Cisco Systems alumnus Eric Yuan. In 2019, the company went public, recorded an 88% increase in revenue, and added 1.9 million new users. However, the arrival of Covid-19 in 2020 propelled Zoom to new heights in usage. Zoom's daily users skyrocketed from around 10 million in December 2019 to 200 million in April 2020. Zoom's iOS app became the top free download in Apple's App Store, with more than 2 million people downloading it in a single day.

As people worldwide remained at home to slow the spread of the coronavirus, Zoom became a critical tool for businesses of all shapes and sizes to continue day-to-day operations. Zoom is the top videoconferencing software used by companies with 500 employees or fewer and the second-most-popular software used by companies with more than 500 employees, trailing only Skype. Schools and colleges that canceled in-person classes turned to Zoom and other platforms. Of all the major videoconferencing platforms, Zoom consistently earns the highest scores for reliability. The company's freemium business model allows casual users to hold calls of up to 40 minutes in length. Zoom's subscription plans for individuals and businesses are affordable, with a $14.99 plan offering extra features and other pricing plans for larger businesses that scale up with higher usage.

However, what's really driven Zoom's rapid growth is its use as a social tool for friends and family to keep in touch, as well as a much-needed avenue for businesses that rely on personal interaction. Creative uses for Zoom have included online play readings and performances, comedy shows, concerts, music lessons, art shows, and church services. Yoga and other forms of exercise studios have flocked to Zoom to hold online classes. Zoom now resembles a new type of social network: Users maintain and update friend lists, can view whether friends are online, and can join public meetups.

Nevertheless, Zoom's path has not been without some serious challenges. Maintaining high quality and reliable services in the midst of skyrocketing demand during a pandemic was critical, for both the company and its users. Zoom's infrastructure is based both on data centers that it leases from co-location/hosting firm Equinix and on the public cloud (including Amazon Web Services, Microsoft Azure, and Oracle). To cope with the surging demand, Zoom had to scale up its usage of cloud services and added two data centers to the 17 it already was using. Maintaining the necessary network bandwidth was a particular focus: Zoom historically keeps 50% more network capacity than its

maximum actual usage. Zoom uses Equinix's Cloud Exchange Fabric, a software-defined network interconnection platform that allows Zoom to easily connect to its infrastructure in other Equinix data centers, as well as to other service providers, to boost capacity. Another focus has been on ensuring that end users are being served by data centers located as physically close to them as possible, reducing latency, which has the potential to degrade video quality.

Security and privacy issues present particularly significant challenges. As Zoom's user base grew, so too did scrutiny of its privacy and security policies, which some experts considered to be so lax as to render Zoom akin to malware. For example, some privacy advocates noted that Zoom's terms of service allowed personal data to be shared with advertisers (and with Facebook when users logged in using their Facebook accounts) by default and argued that Zoom's terms failed to comply with the Family Educational Rights and Privacy Act. Hackers also targeted Zoom users with phishing attacks and exposed vulnerabilities in Zoom's platform that allowed hackers to join active meetings and gain access to user webcams and microphones to engage in "zoombombing." In 2022, Zoom agreed to pay $85 million and bolster its security practices to settle a lawsuit claiming it violated users' privacy rights. Zoom was also criticized for touting its use of end-to-end encryption when in fact it used encryption for only a part of its data transfer processes. One of Zoom's biggest competitive advantages—how easy it is to use (for example, the ability to join a call with just one click)—is something that has also made it vulnerable to attack.

To get a handle on the issues and prevent users from flocking to other platforms, Zoom temporarily froze development on all new feature upgrades to focus on its privacy and security practices. It rolled out a number of fixes for vulnerabilities (for example, amending its privacy policies and updating its iPhone app to stop sending data to Facebook) and stated that it will continue to do so as it reevaluates the balance between ease of use and security. It also released a new version of Zoom that features upgraded 256-bit AES-GCM encryption and a waiting room feature designed to prevent zoombombing.

Analysts believe that Zoom's future is bright. Remote/hybrid work is likely to become a permanent fixture of life. Zoom added many new customers during the pandemic, and most of them are continuing to use its offerings, with Zoom reporting that it had more than half a million customers with more than 10 employees at the end of January 2022, an increase of 9% from 2021. Zoom's revenue has skyrocketed from $622 million for its fiscal year ending on January 31, 2020, to more than $4 billion for the year ending on January 31, 2022. Its net income has followed suit, increasing from just $25 million to $1.375 billion. If Zoom continues on this trajectory, it is likely to take its place in the pantheon of Big Tech giants.

SOURCES: "Cathie Wood's ARK Invest Predicts Bull Run for Zoom, Panning Mandates to End Remote Working as 'Trial-and-Error,'" by Christian Hetzner, Fortune.com, June 9, 2022; "Zoom Agrees to 'Historic' $85 M Payout for Graphic Zoombombing Claims," by Maya Yang, Theguardian.com, April 23, 2022; "Zoom Video Communications, Inc. Form 10-K for the Fiscal Year Ended January 31, 2022," Sec.gov, March 7, 2022; "Zoom Security Issues Are a Wakeup Call for Enterprises," by Jeff Burt, Esecurityplanet.com, January 29, 2022; "Zoom Announces Version 5.0 with Improved Security and Control Features," by Dev Kundaliya, Computing.co.uk, April 23, 2020; "Zoom Goes from Conferencing App to the Pandemic's Social Network," by Drake Bennett and Nico Grant, Bloomberg.com, April 9, 2020; "'Zoom Is Malware': Why Experts Worry About the Video Conferencing Platform," by Kari Paul, *The Guardian*, April 2, 2020; "Zoom to Focus on Security, Privacy, CEO Says, as Usage Booms During Coronavirus Crisis," by Mike Snider, April 2, 2020; "Zoom Meetings Aren't End-to-End Encrypted, Despite Misleading Marketing," by Micah Lee and Yael Grauer, Theintercept.com, March 31, 2020; "Videoconferencing Apps Saw a Record 62M Downloads during One Week in March," by Sarah Perez, Techcrunch.com, March 30, 2020; "Zoom Domains Targeted by Hackers, as Use Surges with COVID-19," by Jessica Davis, Healthitsecurity.com, March 30, 2020; "Zoom Is 2020's Hottest Yoga Studio," by Jacob Kastrenakes, Theverge.com, March 26, 2020; "How Zoom, Netflix, and Dropbox Are Staying Online During the Pandemic," by Yevgenly Sverdlik, Datacenterknowledge.com, March 25, 2020; "For Artists, the Show Must Go On—and Zoom Is Their Venue," by Steven Melendez, Fastcompany.com, March 23, 2020; "Zoom CFO Explains How the Company Is Grappling with Increased Demand," by Jordan Novet, Cnbc.com, March 18, 2020; "We Live in Zoom Now," Taylor Lorenz, Erin Griffith, and Mike Isaac, *New York Times*, March 17, 2020.

programs that roamed the nascent Web, visiting pages and gathering information about the content of each web page. These early programs were variously called crawlers, spiders, and wanderers; the first full-text crawler that indexed the contents of an entire web page was called WebCrawler, released in 1994. AltaVista, one of the first widely used search engines, was the first to allow "natural language" queries such as "history of web search engines" rather than "history + web + search engine."

The first search engines employed simple keyword indexes of all the web pages visited. They would count the number of times a word appeared on the web page and store this information in an index. These search engines could be easily fooled by web designers who simply repeated words on their home pages. The real innovations in search engine development occurred through a program funded by the Department of Defense called the Digital Library Initiative, designed to help the Pentagon find research papers in large databases. Stanford, Berkeley, and three other universities became hotbeds of web search innovations in the mid-1990s. At Stanford in 1994, two computer science students, David Filo and Jerry Yang, created a hand-selected list of their favorite web pages and called it "Yet Another Hierarchical Officious Oracle," or Yahoo!. Yahoo initially was not a real search engine but rather an edited selection of websites organized by categories the editors found useful. Yahoo later developed "true" search engine capabilities.

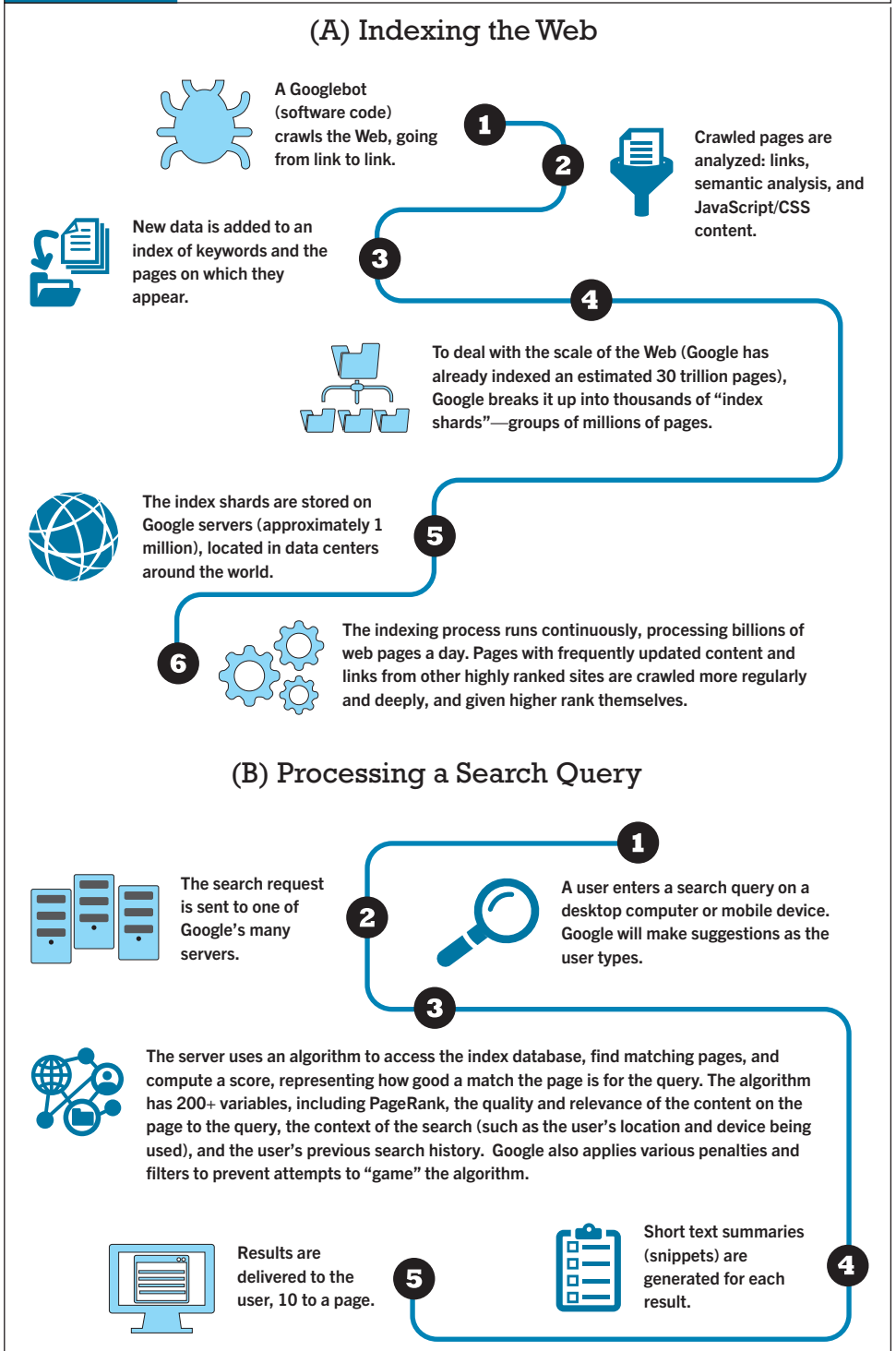
In 1998, Larry Page and Sergey Brin, who were also Stanford computer science students, released their first version of the Google search engine. This search engine was different. It was powered by a unique web crawler program that indexed not just keywords on a web page, but also combinations of words. It also included a web page ranking system (PageRank System) that the search engine used as a central factor in ranking a web page's appropriateness to a search query. These two ideas became the foundation of the Google search engine (Brandt, 2004). **Figure 3.16(A)** illustrates how Google indexes the Web. **Figure 3.16(B)** shows you what happens when you enter a search query.

Initially, few understood how to make money from search engines. That changed in 2000 when Goto.com (later Overture) allowed advertisers to bid for placement on their search engine results, and Google followed suit in 2003 with its AdWords program, which allowed advertisers to bid for placement of short text ads on Google search results pages. The spectacular increase in Internet advertising revenues has helped search engines transform themselves into major shopping tools and created an entirely new industry called "search engine marketing."

When users enter a search term into Google or Bing, or any of the other websites serviced by these search engines, they receive two types of listings: sponsored links, for which advertisers have paid to be listed (usually at the top of the search results page), and unsponsored, "organic" search results. Advertisers can also purchase small text ads on the right side of the search results page. In addition, search engines have extended their services to include news, maps, satellite images, computer images, e-mail, group calendars, group meeting tools, and indexes of scholarly papers.

Although the major search engines are used for locating general information of interest to users, search engines have also become a crucial tool within e-commerce sites. Customers can more easily search for the product information they want with the help of an internal search program; the difference is that within websites, the search engine is limited to finding matches in that one site. For instance, online shoppers often use Amazon's internal search engine to look for products rather than conduct a product search using Google.

FIGURE 3.16 HOW GOOGLE WORKS



DOWNLOADABLE AND STREAMING MEDIA

download
to transfer a file from a web server and store it on a computer for later use

streaming media
enables video, music, and other large-bandwidth files to be sent to a user in a variety of ways that enable the user to play the files as they are being delivered

When you **download** a file from the Web, the file is transferred from a web server and is stored on your computer for later use. With the low-bandwidth connections of the early Internet, audio and video files were difficult to download, but with the huge growth in broadband connections, these files are not only commonplace but today also constitute the majority of web traffic. **Streaming media** is an alternative to downloaded media and enables video, music, and other large-bandwidth files to be sent to a user in a variety of ways that enable the user to play the files as they are being delivered. In some situations, the files are broken into chunks and served by specialized media servers to client software that puts the chunks together and plays the video. In other situations, a single large file is delivered from a standard web server to a user who can begin playing the video before the entire file is delivered. Streamed files must be viewed in real time; they cannot be stored on client hard drives without special software. Streamed files are "played" by a software program, such as Microsoft Windows Media and Apple QuickTime, or via a service that provides an app, such as those provided by Netflix, Amazon Prime Video, YouTube, Hulu, Facebook, and many others.

Spurred on by the worldwide sales of more than 5 billion iOS (iPhones, iPads, and iPod Touches) and Android devices in aggregate, the Internet has become a virtual digital river of music, audio, and video files. Apple Music (which has taken the place of Apple's iTunes store) is probably the most-well-known repository of digital music online, with more than 90 million songs in its catalog as of 2022. YouTube Music offers more than 80 million songs, and there are hundreds of other apps and sites that also offer streaming music services such as Spotify, Pandora, Amazon Prime Music, Tidal, and hundreds of others.

podcast
audio presentation, such as a radio show, audio from a conference, or simply a personal audio presentation, stored online as a digital media file

Podcasting (the name originated from a mashup of the word "iPod" and the word "broadcasting") is also surging in popularity. A **podcast** is a digital audio presentation, such as a radio show, audio from a conference, or simply a personal presentation, stored online as a digital media file. Listeners can download the file and play it on their mobile devices or computers. Podcasting has transitioned from an amateur, independent-producer medium in the "pirate radio" tradition to a professional talk content distribution channel. More than one-third of the U.S. population (about 125 million people) listen to podcasts monthly. iHeartRadio is the top U.S. producer of podcasts, with more than 630 active podcasts and an aggregate monthly audience of more than 31 million in the United States (Insider Intelligence/eMarketer, 2022k; Podtrac, Inc., 2022).

Online video viewing has also exploded in popularity. In 2022, for instance, there are almost 260 million people in the United States who watch streaming or downloaded video content on a desktop or mobile device at least once a month (Insider Intelligence/eMarketer, 2022l). The Internet has become a major distribution channel for movies, television shows, and sporting events (see Chapter 10). Another common type of Internet video is provided by YouTube, with more than 2 billion users worldwide who each day watch more than 1 billion hours of video content ranging from a wide variety of user-generated content, branded content from major corporations, music videos, original programming, and more. User-generated video streaming on YouTube, Facebook, Instagram, TikTok, Twitch, and many others has also become very popular. According to Sandvine, a leading application and network intelligence company, streaming video accounted for more than 50% of all Internet traffic in 2021, with YouTube, Netflix, Facebook, and TikTok accounting for about a third of that traffic (Sandvine, 2022).

Online advertisers increasingly use video to attract viewers. Companies that want to demonstrate the uses of their products have found video clips to be extremely effective. Streaming video segments used in web ads and news stories are perhaps the most frequently used streaming services. High-quality, interactive video and audio make sales presentations and demonstrations more effective and lifelike and enable companies to develop new forms of customer support.

WEB 2.0 APPLICATIONS AND SERVICES

Today's broadband Internet infrastructure has greatly expanded the services available to users and has formed the basis for new business models. Web 2.0 applications and services are "social" in nature because they support communication among individuals within groups or social networks.

Online Social Networks

Online social networks are services that support communication within networks of friends, acquaintances, people with similar interests, colleagues, and even entire professions. Online social networks have developed very large worldwide audiences (almost 3.7 billion people in 2022, more than 55% of the world's population) and form the basis for advertising platforms and social e-commerce (see Chapters 6, 7, and 11). The largest social networks worldwide in 2022 are Facebook (with about 2.9 billion users), Instagram (with around 1.3 billion users), LinkedIn (with more than 830 million users), TikTok (with around 750 million users), Snapchat (with around 465 million users),Pinterest (with around 430 million users), and Twitter (with around 345 million users). YouTube, with more than 2 billion users, can also be considered a social network as well as an online content platform. These networks rely on user-generated content (messages, photos, and, increasingly, videos) and emphasize sharing of content. The users who produce this online content are now generally referred to as "creators" (and also sometimes as "influencers"), and an ecosystem known as the creator economy, comprised of supporting tools and platforms, has sprung up around them (see Chapters 1 and 2 for a further discussion of creators and the creator economy).

Blogs

A **blog** (originally called a **weblog**) is a personal web page that typically contains a series of chronological entries (newest to oldest) by its author and links to related web pages. The blog may include a blogroll (a collection of links to other blogs) and trackbacks (a list of entries in other blogs that refer to a post on the first blog). Most blogs allow readers to post comments on the blog entries as well. The act of creating a blog is often referred to as "blogging." Blogs are either hosted by a third-party site such as WordPress, Tumblr, Blogger, LiveJournal, TypePad, and Xanga, or prospective bloggers can download software such as Movable Type to create a blog that is hosted by the user's ISP. Blog pages are usually variations on templates provided by the blogging service or software and hence require no knowledge of HTML. Therefore, millions of people without HTML skills of any kind can post their own web pages and share content with friends and relatives. The totality of blog-related websites is often referred to as the "blogosphere."

blog (weblog)
personal web page that is created by an individual or business to communicate with readers

Blogs have become hugely popular. Tumblr and WordPress together host more than 600 million blogs as of 2022, so it is likely that the total number of blogs is significantly higher. No one knows how many of these blogs are kept up to date or are just yesterday's news. And no one knows how many of these blogs have a readership greater than one (the blog author). In fact, there are so many blogs that you need a search engine just to find them, or you can just go to a list of the most popular 100 blogs and dig in.

Wikis

wiki
web application that allows a user to easily add and edit content on a web page

A **wiki** is a web application that allows a user to easily add and edit content on a web page. (The term wiki derives from the "wiki wiki" (quick or fast) shuttle buses at Honolulu Airport.) Wiki software enables documents to be written collectively and collaboratively. Most wiki systems are open-source, server-side systems that store content in a relational database. The software typically provides a template that defines layout and elements common to all pages, displays user-editable source code (usually plain text), and then renders the content as an HTML-based page for display in a web browser. Some wiki software allows only basic text formatting, whereas others allow the use of tables, images, or even interactive elements such as polls and games. Because wikis by their very nature are very open in allowing anyone to make changes to a page, most wikis provide a means to verify the validity of changes via a "Recent Changes" page, which enables members of the wiki community to monitor and review the work of other users, correct mistakes, and hopefully deter "vandalism."

The most well-known wiki is Wikipedia, an online encyclopedia that contains more than 58 million articles in more than 300 different languages on a variety of topics. The Wikimedia Foundation, which operates Wikipedia, also operates a variety of related projects, including Wikibooks, a collection of collaboratively written free textbooks and manuals; Wikinews, a free content news source; and Wiktionary, a collaborative project to produce a free multilingual dictionary in every language, with definitions, etymologies, pronunciations, quotations, and synonyms.

WEB3

Web3
new kind of Internet service conceived as being built with blockchain to create a much more decentralized environment than the current Web

Although what some are calling "Web3" does not yet exist, the concepts surrounding it have been much in the news. **Web3** is the name of a new kind of Internet service conceived as being built using blockchain. Blockchain is a distributed and shared ledger (database system) that underlies cryptocurrencies such as Bitcoin but that can also be used for a variety of other purposes. (We examine blockchain in further detail in Chapter 5.) Proponents behind the concept of Web3 envision it as being much more decentralized than the current Web environment and controlled by creators and users rather than Big Tech companies. Centralized corporate platforms such as Google, Meta, and Twitter would be replaced with decentralized, community-run networks. Transparency and data privacy would be enhanced.

Critics, on the other hand, point out that even the most advanced blockchain technology today could not begin to handle the amount of data that Facebook, YouTube, or Twitter processes daily. Some form of centralized services would be required, which would defeat the central purpose of Web3. Whether some version of Web3 will come to fruition in the future remains to be seen, but in the meantime, the hype around it is likely to continue.

VIRTUAL REALITY, AUGMENTED REALITY, AND THE METAVERSE

Virtual reality (VR) involves fully immersing users within a virtual world, typically through the use of a head-mounted display (HMD) connected to headphones and other devices that enable navigation through the experience and allowing users to feel as if they are actually present within the virtual world. Higher-end VR devices designed to be used with PCs or gaming systems include various Meta (formerly Facebook Oculus) headsets such as Rift and Quest, HTC's Vive, and Sony's PlayStation VR. Samsung's Gear VR and Google Cardboard are examples of lower-cost, mobile, entry-level devices. There are an estimated 67 million virtual reality users in the United States in 2022, and this number is expected to increase to more than 75 million by 2025 (Insider Intelligence/eMarketer, 2022m).

virtual reality (VR) involves fully immersing users within a virtual world, typically through the use of a head-mounted display (HMD) connected to headphones and other devices

Augmented reality (AR) involves overlaying virtual objects on top of the real world via smartphones, tablets, or HMDs. There are an estimated 90 million augmented reality users in the United States in 2022, and that number is expected to grow to more than 110 million by 2025 (Insider Intelligence/eMarketer, 2022n). Among the highest-profile uses of AR thus far has been in Nintendo's Pokémon Go game. Other uses include Snapchat's Lenses feature, which uses facial recognition technology and 3-D models that allow users to augment their selfies by overlaying animations or other images on top of them, and "try-before-you-buy" apps. Growth in the use of AR has been accelerated by the availability of Apple's ARKit, Google's ARCore, and Meta's Spark AR Studio software development platforms, which have helped establish industry standards for creating AR applications. **Mixed reality (MR)** is an enhanced version of augmented reality in which virtual images can interact with the real environments onto which they are overlaid. Microsoft's HoloLens, a head-mounted holographic computer, is an example of a device created to enable mixed reality.

augmented reality (AR) involves laying virtual objects over the real world via smartphones, tablets, or HMDs

mixed reality (MR) enhanced version of augmented reality in which virtual images can interact with the real environments onto which they are overlaid

The metaverse has its roots in current technologies such as virtual reality, augmented reality, and avatar-based virtual worlds. The **metaverse** is envisioned as an immersive, visual, 3-D virtual reality in which users can connect, socialize, collaborate, and transact. Facebook believes that the metaverse will become the center of the future Web, so much so that in October 2021, Facebook announced that it was rebranding as Meta. Facebook's announcement has kicked off a wellspring of hype, buzz, and interest. Mark Zuckerberg, Facebook's founder and CEO, believes that the metaverse is the ultimate expression of social technology. He characterizes it as an "embodied Internet" where instead of just viewing content in 2-D, you experience being "in it" just as if you were physically present. Although VR, AR, and metaverse-like experiences are currently being used primarily for gaming and advertising, Zuckerberg and others believe that the metaverse ultimately will create a profound change in the ways people experience online life and work. Meta, Google, Microsoft, Apple, and many other companies are all working on metaverse-related products. We examine current and future potential applications of the metaverse throughout the text.

metaverse an immersive, visual, 3-D virtual reality in which users can connect, socialize, collaborate, and transact

INTELLIGENT DIGITAL ASSISTANTS

The idea of having a conversation with a computer, having it understand you, and having it be able to carry out tasks according to your direction has long been a part of science fiction, from the 1968 Hollywood movie *2001: A Space Odyssey* to the first *Star Wars* film,

which introduced the famous robot droids C-3PO and R2-D2, who used their AI capabilities to help the Rebel Alliance. That was all fantasy. But Apple's Siri, billed as an intelligent personal assistant and knowledge navigator and released in 2011, has many of the capabilities of the computer assistants found in fiction. Siri has a natural-language, conversational interface and situational awareness and is capable of carrying out many tasks based on verbal commands by delegating requests to a variety of different web services. For instance, you can ask Siri to find a restaurant nearby that serves Italian food, and Siri may show you an ad for a local restaurant. Once you have identified a restaurant you would like to eat at, you can ask Siri to make a reservation using OpenTable. You can also ask Siri to place an appointment on your calendar, search for airline flights, and figure out the fastest route, using public transit, between your current location and a particular destination. The answers are not always completely accurate, but critics have been impressed with Siri's uncanny abilities. Siri is currently available on a wide variety of Apple devices.

In 2012, Google released Google Now, its version of an intelligent digital assistant for Android-based smartphones. Google Now was part of the Google Search mobile application. While Google Now had many of the capabilities of Apple's Siri, it attempted to go further by predicting what users might need based on situational awareness, including physical location, time of day, previous location history, calendar, and expressed interests based on previous activities.

In 2015, Amazon launched the Amazon Echo, a voice-controlled home speaker equipped with underlying AI technology known as Alexa. Amazon has marketed the Echo as a home assistant that can perform a variety of tasks such as updating to-do lists, adjusting compatible home appliances, and streaming music, all controlled by voice. Echo and other Alexa-powered devices feature these and other "skills" that function much like apps do on the iPhone. For example, 1-800-Flowers was one of the first large retailers to develop a capability that allows users to place orders by voice alone on any Amazon device running Alexa. Although customers interested in using this capability must have their account info, payment info, and addresses already on file, this represents an important, new sales channel for businesses. A number of companies and organizations have developed skills for Alexa. As of 2022, Alexa has more than 130,000 skills, a rapid increase from just 135 in early 2016, and Amazon has released much of its core AI technology to third-party developers, allowing them to create more skills. The Echo jumped to a huge early lead in the market for smart home appliances and continues to remain in that position, with about a 66% market share in 2022. The company has released a variety of versions of the Echo, including the disc-sized Echo Dot; the Echo Show, which features a touchscreen display and camera; and the Echo Spot, which is a more compact version of the Echo Show and features a much smaller screen.

In 2016, Google supplanted Google Now with Google Assistant, a similar virtual assistant that comes preinstalled on all Android phones using operating system version 6.0 or later, as well as its Google Home smart home speaker (now rebranded as Nest Audio). Google Assistant is excellent at answering trivia-style questions thanks to Google's trove of search engine data, and while it does not have as many skills as Alexa does, Google Assistant has continued to add new features, such as custom voice commands for third-party appliances that remove the extra phrases typically required to speak directly to a device; removal of limits on audio playback, allowing Assistant to play audio of soothing rain or other ambient noise, as well as long-form interviews; and subscriptions offered by content creators such as magazine publisher Hearst with daily

tips and advice. Google Assistant is available on millions of Android devices and has a strong international presence.

In 2017, Apple finally released its own voice-activated speaker, HomePod, which it markets as a high-quality option with a special emphasis on music. However, the HomePod lags significantly behind Echo and Google Nest Audio speakers in breadth of features and capabilities and accounts for just a small percentage of the U.S. market for home assistants.

Companies have rushed to this market based on expectations that consumers will increasingly be using voice to search for products as well as to make purchases. However, thus far the number of U.S. consumers using smart speakers to make voice-based purchases has not increased as rapidly as analysts initially expected, with only about 27% of U.S. smart speaker users doing so in 2022. Privacy and security concerns remain significant hurdles. For example, several different teams of researchers have exposed potential vulnerabilities of smart speakers, including the possibility of hacking them and turning them into surveillance devices. Although Echo devices require the command "Hey, Alexa" before they spring into action in a noticeable way, the devices are always on as they await that command. Without heavy emphasis on anonymization and ethical policies, smart speakers could enable unprecedented violations of privacy. However, despite these concerns, smart speakers and devices with voice-controlled assistants are now firmly in the mainstream (Insider Intelligence/eMarketer, 2022o, 2022p).

3.5 MOBILE APPS

When Steve Jobs introduced the iPhone in 2007, no one, including himself, envisioned that the device would launch a software revolution or become a major e-commerce platform, let alone a game platform, an advertising platform, and a general media platform for television shows, movies, videos, and e-books. The iPhone's original, primary functions, beyond being a cellphone, were to be a camera, a text messaging device, and a web browser. What Apple initially lacked for the iPhone were software applications ("apps") that would take full advantage of its computing capabilities. The solution was apps created by outside developers. In July 2008, Apple introduced the App Store, which provides a platform for the distribution and sale of apps by Apple as well as by independent developers. Around the same time, Google was developing Android as an open-source operating system for mobile devices. In October 2008, the first smartphone using Android was released, and Google launched the Android Market (now called Google Play) as the official app store for Android. In 2010, tablet computers such as Apple's iPad and the Samsung Galaxy Tab, which provided additional platforms for mobile apps, were introduced.

From this beginning has sprung a whole new world. In 2021, 230 billion apps were downloaded, and consumers spent $170 billion on apps, subscriptions, and other forms of in-app spending worldwide (Data.ai, 2022). As of 2022, there are around 1.8 million apps available for download from the Apple App Store and about 2.6 billion available for Android devices on Google Play (Apple, 2022; Appbrain, 2022). The mobile app phenomenon has spawned a digital ecosystem: tens of thousands of developers, a wildly popular hardware platform, and millions of consumers using mobile devices to replace their clunky desktop/laptop computer and act as a digital media center as well. Mobile apps

have even usurped TV as the most popular entertainment medium. More consumers are opting to consume media on their phones and tablet computers than ever before, which is more good news for app developers.

The implications of the app ecosystem for e-commerce are significant: The smartphone in your pocket or the tablet computer on your lap has become not only a general-purpose computer but also an always-present shopping tool as well as an entirely new marketing and advertising platform for vendors. Early e-commerce applications using desktops and laptops were celebrated as allowing people to shop at home in their pajamas. Smartphones and tablets extend this range to far beyond the home: You can now shop anywhere, everywhere, and all the time, in between talking, texting, watching video, and listening to music. Almost all of the top brands have a presence in at least one of the major app stores, and more than 90% have an app in the Apple App Store. M-commerce in the form of purchases of retail and travel products and services via a mobile device is expected to generate more than $500 billion in 2022 in the United States (Insider Intelligence/eMarketer, 2022q, 2022r).

PLATFORMS FOR MOBILE APPLICATION DEVELOPMENT

Unlike mobile websites, which can be accessed by any web-enabled mobile device, native apps, which are designed specifically to operate using the mobile device's hardware and operating system, are platform-specific. Applications for the iPhone, iPad, and other iOS devices can be written in Swift, a programming language introduced by Apple in 2014 specifically for developing iOS applications, or the Objective-C programming language using the iOS SDK (software developer kit). Applications for Android operating system–based phones typically are written using Java, although portions of the code may be in the C or C++ programming language. In addition to creating native apps using a programming language such as Swift, Objective-C, or Java, there are hundreds of low-cost or open-source app development toolkits that make creating cross-platform mobile apps relatively easy and inexpensive without having to use a device-specific programming language. See Section 4.6 in Chapter 4 for more information.

APP MARKETPLACES

Once written, applications are distributed through various marketplaces. Android apps for Android-based phones are distributed through Google Play, which is controlled by Google. iPhone and iPad applications are distributed through Apple's App Store. Apps can also be purchased from third-party vendors such as Amazon's Appstore for Android. It is important to distinguish "native" mobile apps, which run directly on a mobile device and rely on the device's internal operating system, from web apps, which install into your browser, although web apps can operate in a mobile environment as well.

3.6 CAREERS IN E-COMMERCE

In this section, we'll examine a job posting by a company looking to fill a position that requires an understanding of the basic technologies underlying the Internet, the Web, and the mobile platform.

THE COMPANY

The firm was one of the first companies to identify the replacement battery market for digital devices such as PCs, laptops, and smartphones. The company distributes batteries, lights, and support services for digital devices through franchised retail stores, websites, and sales to businesses (B2B). It also operates Amazon and eBay stores. More recently, it entered the tablet and personal computer repair and maintenance, battery recycling, and lighting markets. Today the company has more than 600 franchised retail stores and several websites. The company also has an inventory of more than 50,000 types of batteries, light bulbs, and accessories.

POSITION: E-COMMERCE SPECIALIST

You will work with a team of employees in the E-commerce Department, with the missions of coordinating multiple websites serving different product lines and market channels and recommending new technologies to the firm, including cloud computing, software as a service (SaaS), mobile channel development, virtual reality techniques, and video tools. The company is looking for a person who is passionate about its business and who has a knack for technology, the Internet, and mobile devices and for how they can be used in business. Responsibilities include:

- Introducing Internet, web, and mobile technology applications to other departments and preparing reports for their managers on new opportunities to apply these technologies to business opportunities and challenges.
- Collaborating with product line and marketing departments to develop a common understanding of the importance of an integrated online and mobile e-commerce presence.
- Working with franchise retail stores to inform them of new technology initiatives that the firm will be launching, preparing presentations to franchisees, and gathering feedback.
- Collaborating with the IT Department to develop more cost-effective e-commerce technology and enterprise platforms, including cloud computing infrastructure and SaaS.
- Developing strategic plans, roadmaps, and budgets to help guide the firm's e-commerce efforts over the next five years.
- Marketing and conducting general Internet research.

QUALIFICATIONS/SKILLS

- Bachelor's degree in computer science, management information systems, and/or business administration, with e-commerce and digital marketing courses.
- Background understanding and experience with e-commerce, content management, and database-driven applications.
- Basic knowledge of Internet, web technology, and mobile devices/platforms and their use in e-commerce.

- Demonstrated awareness of how the Internet and mobile platforms may change in the near future.
- Basic knowledge of cloud computing, both hardware and software.
- Basic knowledge and understanding of interactive media, tools, and technologies.
- Ability to work with a variety of teams in IT, marketing, and supply chain management.
- Excellent verbal and written communication skills.
- Strong focus, self-discipline, and time management skills.

PREPARING FOR THE INTERVIEW

To prepare for this interview, review Sections 3.1, 3.2, and 3.3 to make sure that you understand and are able to appropriately use the basic terminology that describes Internet/web infrastructure. Pay particular attention to the material about cloud computing in Section 3.1 and be able to discuss the various services offered by Amazon Web Services (Table 3.4) as well as the material about wireless/mobile Internet access in both that section and Section 3.2. It would be helpful for you to be able to discuss the trends in e-commerce infrastructure detailed in Table 3.1. Be aware of trends such as the Internet of Things (IoT), and be able to discuss its potential impact on the business. Finally, review Sections 3.4 and 3.5 so that you can discuss how Internet/web technology is put to work to benefit a business. You should be familiar with all of the various software applications and tools discussed in those sections, ranging from mobile apps to communication tools, search engines, different types of media, various Web 2.0 applications and services, and tools such as virtual reality, augmented reality, the metaverse, and intelligent digital assistants.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. Currently our e-commerce operations are spread across various product lines (batteries, lights, and industry power solutions) and different marketing channels. What ideas do you have for integrating these diverse web activities into a coherent online and mobile presence?

You could salute the efforts of the firm to bring all its e-commerce and online operations into a single e-commerce department. Bringing all the major e-commerce players in the company together and having them collaborate on a company policy seems to be a good starting point. It is important to develop a consistent online brand.

2. We're using smartphones for everything from store checkout to customer management to logistics. But we don't really have a consumer-oriented mobile strategy. How do you suggest we develop mobile into a consumer sales tool?

You might inquire about the percentage of the company's sales that originate from mobile devices. The future is increasingly mobile. Mobile devices now account for more and more purchase, search, and browsing activities. The firm should focus on developing its mobile search capabilities and build mobile sites and/or a mobile app that allow users to browse and purchase the company's products.

3. What ideas do you have for applying the Internet of Things (IoT) to our business?

One possibility is to have sensors record the movements of customers in stores and suggest purchase opportunities based on the customers' store location—a kind of very local geo-marketing. Perhaps certain products could have sensors built into them and be capable of sending data, such as battery charge levels, back to the firm's data centers. Consumers could be alerted to when their batteries are losing the ability to recharge and therefore should be replaced.

4. Currently most of the company's computer operations are located in a company data center. We use a collection of software tools developed over many years for logistics, supply chain management, and customer data. What suggestions do you have for using cloud computing and SaaS?

You can note that cloud computing comes in a variety of forms and that there are multiple vendors. Cloud computing includes renting infrastructure, software, database, and networking services. In almost all cases, a firm can reduce its infrastructure costs and get to market much more quickly by using cloud computing rather than operating its own data centers.

5. How can we use video and streaming media to connect with our retail customers?

You could remark that video is becoming almost as important as text for developing a brand and attracting customers. The firm should consider creating a YouTube channel to market its products and to show people how to use the products.

3.7 CASE STUDY

Akamai:

Sharpening Internet Content Delivery with Edge Computing

In 2022, the amount of Internet traffic generated by YouTube alone is greater than the amount of traffic on the entire Internet in 2000. Video now comprises the majority of Internet traffic, with YouTube, Netflix, Facebook, and TikTok the top platforms. Internet traffic from mobile devices has also grown significantly, with the majority of such traffic now originating from mobile devices.

In today's broadband environment, the threshold of patience is very low. Most users will leave a page that takes more than three seconds to load. Increased customer expectations are bad news for anyone seeking to deliver high-definition video and other forms of interactive content and services online. Akamai is one of the Internet's major helpers. An overwhelming majority of top companies in various industries use Akamai's services to speed delivery of content.

Slowly loading web pages and content sometimes result from poor design, but more often than not, the problem stems from the underlying infrastructure of the Internet. The Internet is a collection of networks that has to pass information from one network to another. Sometimes the handoff is not smooth. The TCP protocol requires that every 1,500-byte packet of information sent over the Internet be verified by the receiving server

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and an acknowledgment sent to the sender. This not only slows down the distribution of video and audio content but also slows down interactive requests, such as purchases, that require the client computer to interact with an online shopping cart. Moreover, each packet may go through many different servers on its way to its final destination, multiplying by several orders of magnitude the number of acknowledgments required to move a packet from, say, New York City to San Francisco. The Internet today spends much of its time and capacity verifying packets, which contributes to a problem called "latency" or delay. For this reason, a single e-mail with a 1-megabyte PDF file attachment can create more than 50 megabytes of Internet traffic and data storage on servers, client hard drives, and network backup drives. Load times have also increased significantly as pages become laden with more content of various types, further complicating content distribution.

Akamai Technologies was founded by Tom Leighton, an MIT professor of applied mathematics, and Daniel Lewin, an MIT grad student, with the idea of expediting Internet traffic to overcome these limitations. Lewin's master's thesis was the theoretical starting point for the company. It described storing copies of web content such as pictures or video clips at many different locations around the Internet so that one location could always retrieve a nearby copy, making web pages load faster. This is the idea behind edge computing: locating computing and data storage in servers as close as possible to the location where they are needed in order to reduce latency, improve response time, and save bandwidth. Akamai was the first company to offer edge computing services to its customers.

Officially launched in August 1998, Akamai's current products are based on its Akamai Intelligent Edge Platform, a cloud platform made up of approximately 360,000 servers within 1,350 networks located in more than 135 countries around the world, all within a single network hop of 90% of all Internet users. In 2022, Akamai announced that traffic delivered across its network had hit a new peak of 250 terabits per second (Tbps). To put that number in perspective, at 250 Tbps you could download every feature film in the IMDb database in 37 seconds! Akamai typically delivers around 100 Tbps in daily web traffic and can support millions of concurrent viewers.

Akamai software allows the platform to optimize content delivery based on device-level detection, identify and block security threats, provide comprehensive knowledge of network conditions, route traffic away from trouble spots, as well as provide business, technical, and analytical insights to their customers' online operations. Accomplishing these daunting tasks requires Akamai to monitor the entire Internet, locating potentially sluggish areas and devising faster routes for information to travel. Frequently used portions of a client's website, or large video or audio files that would be difficult to send to users quickly, are stored on Akamai's servers. When a user requests an audio or a video file, the request is redirected to a nearby Akamai server, and the content is served from this local server. Akamai's servers are placed in Tier 1 backbone supplier networks, large ISPs, universities, and other networks. Akamai's software determines which server is optimal for the user and then transmits the content locally. For instance, someone in New York City who visits eBay's website will be served web pages from the New York metro area Akamai servers, while users who live in San Francisco will be served pages from Akamai servers in San Francisco. Websites that are "Akamaized" can be delivered anywhere from 4 to 10 times as quickly as non-Akamaized content. An Akamai Image Manager tool automates image conversion of large image files to speed load times on image-heavy web pages.

SOURCES: "Facts & Figures," Akamai.com, accessed June 8, 2022; ""Already on the Edge, Akamai Sets Its Sights on Cloud Computing and Security," by Donna Goodison, Protocol.com, June 8, 2022; "Oops, We Did It Again," by Akamai, Linkedin.com, May 5, 2022; "Why Linode+Akamai Is Transformational for How Developers Use the Cloud," by Tom Leighton, Akamai.com, April 12, 2022; "Akamai Inc. Form 10-K for the Fiscal Year Ended December 31, 2021, Sec.gov, February 28, 2022; "Share of Global Mobile Website Traffic 2015–2021," by J. Clement, Statista.com, February 18, 2022; "The Global Internet Phenomena Report 2022," Sandvine.com, January 2022; "How Akamai Evolved into a Security Vendor," by Michael Vizard, Securityboulevard.com, September 8, 2021; "Global Internet Traffic and Capacity Return to Regularly Scheduled Programming," by Alan Maudlin, Blog.telegeography.com, September 7, 2021; "Why Developers Are Writing Apps on Our Edge Platform," by Tom Leighton, Akamai.com, May 11, 2021.

Akamai has a wide range of large corporate and government clients: 50% of Fortune 500 companies, 19 of the top 20 U.S. e-commerce retailers, 18 of the top 20 video streaming services, 9 of the top 10 brokerages, 7 of the top 10 banks, and all of the United States' military branches. Notable customers include Airbnb, Coca-Cola, eBay, FedEx, Fidelity, Marriott, NBCUniversal, PayPal, Riot Games, Spotify, Viacom, Warner Media, and the *Washington Post*, among many others.

Cloud computing, the mobile platform, and the popularity of streaming video all have provided Akamai with growth opportunities. However, the growth of streaming video also created new challenges for Akamai. Many companies that formerly were Akamai clients, including Apple, Facebook, Google, Microsoft, and Netflix, have shifted their content delivery operations away from Akamai's platforms and onto in-house CDNs. Other competitors in content delivery, such as Amazon's CloudFront, Cloudflare, Fastly, and StackPath, also represent threats to Akamai's continued dominance.

In 2022, Akamai took steps to bolster its edge computing business with the acquisition of Linode for $900 million. Linode, an infrastructure as a service (IaaS) provider, will enable Akamai to provide businesses with a developer-friendly platform to build, run, and secure cloud applications. Prior to its acquisition, Linode offered developers an affordable alternative to the "big three" cloud providers (Amazon Web Services, Microsoft Azure, and Google Cloud Platform). Akamai anticipates that in the future, customers will have a growing need for a continuum of computing services from the cloud to the edge in order to be closer to where billions of end users and tens of billions of connected devices will be, especially as the use of technologies such as 5G and IoT expands. Tom Leighton, co-founder of Akamai, believes that Akamai's presence at the edge provides Akamai with a unique competitive advantage and notes that, unlike Akamai's, the data centers of the major cloud providers and other CDNs are typically located closer to the core of the Internet and far from their users. Gartner estimates that by 2025, 75% of enterprise-generated data will be created and processed at the edge. Akamai believes its acquisition of Linode will enable Akamai to create the world's most distributed computing platform, with the global reach to enable any cloud application to deliver the best end-user experience no matter where the end user is located.

Akamai has also developed a number of other services. Chief among them is its security offerings, which now comprise an equally important part of its business as its content delivery and edge technology services. Cyberattacks, organized crime online, and state-sponsored cyberwarfare are all on the rise, not just against its clients but also against CDNs like Akamai itself. Akamai began providing security services to protect U.S. government websites in 2001 and expanded those services to businesses such as banks in 2012. Since then, it has continued to improve its offerings, and today its web app firewall solution (Web App and API Protector [WAAP], formerly known as Kona Site Defender) is the market leader. In 2021, Akamai bought network security firm Guardicore for $600 million, adding its micro-segmentation technology that blocks the spread of malware, particularly ransomware, to its portfolio. Going forward, Akamai believes that the unique combination of its various services (cloud computing services, edge computing, content delivery, and security) puts it in a very strong position vis-à-vis its competitors.

Case Study Questions

1. Why does Akamai geographically disperse its servers to deliver its customers' web content?
2. How has Akamai evolved since it first began?
3. Why does Akamai believe that edge computing will become even more important than it is today?

3.8 REVIEW

KEY CONCEPTS

■ Discuss the origins of, and the key technology concepts behind, the Internet.

- The Internet has evolved from a collection of mainframe computers located on a few U.S. college campuses to an interconnected network of thousands of networks and millions of computers that is accessed by more than 4.5 billion people worldwide.
- The history of the Internet can be divided into three phases: the Innovation Phase (1961–1974), the Institutionalization Phase (1975–1995), and the Commercialization Phase (1995 to the present).
- Packet switching, the TCP/IP protocol suite, and client/server technology are key technology concepts behind the Internet.
- The mobile platform has become the primary means for accessing the Internet.
- Cloud computing refers to a model of computing in which firms and individuals obtain computing power and software applications over the Internet rather than purchase the hardware and software and install it on their own computers.
- Internet protocols such as HTTP, SMTP, POP, IMAP, FTP, SSL, and TLS enable various services on the Internet, such as the transfer of web pages, e-mail, file transfer, and security.

■ Explain the current structure of the Internet.

- The main elements of the Internet's infrastructure are the backbone (composed primarily of high-bandwidth fiber-optic cable networks, owned by various Tier 1 Internet Service Providers [ISPs]), Internet Exchange Points (IXPs), which are hubs that use high-speed switching computers to connect to the backbone, Tier 3 ISPs, which provide Internet access to homes and offices, and the mobile platform, which provides Internet access via cellular telephone networks and Wi-Fi networks.
- The Internet of Things (IoT) builds on a foundation of existing technologies—such as RFID tags, low-cost sensors, inexpensive data storage, big data analytics software, and IPv6—to power the development of a large number of smart connected "things."
- Governing bodies such as ICANN, IETF, IRTF, IESG, IAB, ISOC, IGF, and W3C have influence over the Internet and monitor its operations, although they do not control it.

■ Understand how the Web works.

- The Web was developed during 1989–1991 by Dr. Tim Berners-Lee, who created a computer program that allowed formatted pages stored on the Internet to be linked using keywords (hyperlinks). In 1993, Marc Andreessen created the first graphical web browser, which made it possible to view documents on the Web graphically and created the possibility of universal computing.

- The key concepts you need to be familiar with in order to understand how the Web works are hypertext, HTTP, URLs, HTML, CSS, XML, web server software, web clients, and web browsers.

■ Describe how Internet and web features and services support e-commerce.

- Together, the Internet and the Web make e-commerce possible by allowing people to access product and service information and to complete purchases online.
- Some of the specific features that support e-commerce include communication tools (such as e-mail, messaging applications, online message boards, Internet telephony, videoconferencing, video chatting, and telepresence); search engines; and downloadable and streaming media.
- Web 2.0 applications and services include social networks, blogs, and wikis.
- Web3 does not yet exist but is envisioned as a new kind of Internet service: one that is based on blockchain technology, that will be much more decentralized than the current Web environment, and that will be controlled by creators and users rather than by Big Tech companies.
- Virtual reality, augmented reality, the metaverse, and intelligent digital assistants have begun to enter the consumer market and attract significant attention.

■ Understand the impact of mobile applications.

- The mobile app phenomenon has spawned a new digital ecosystem, with important implications for e-commerce. Almost all of the top brands now have mobile apps, which are increasingly being used for m-commerce.
- There are a variety of different platforms for mobile application development, including Swift and Objective-C for iOS devices and Java (and C and C++ for certain elements) for Android smartphone devices.
- Mobile apps for the iPhone are distributed through Apple's App Store and are distributed for Android devices through Google Play. There are also third-party vendors such as Amazon's Appstore.

QUESTIONS

1. What are the three basic building blocks of the Internet?
2. What is an IPv6 address? Why are IPv6 addresses necessary?
3. Explain how packet switching works.
4. How is the TCP/IP protocol related to information transfer on the Internet?
5. What technological innovation made client/server computing possible?
6. What is cloud computing, and how has it impacted the Internet?
7. Why are smartphones a disruptive technology?
8. What role does a Tier 1 ISP play in Internet infrastructure?
9. What function do IXPs serve?
10. What is 5G?
11. What are the differences among a public, a private, and a hybrid cloud?
12. How does UDP differ from TCP?
13. What are some of the challenges of policing the Internet? Who has the final say when it comes to content on the Internet?
14. Compare and contrast the capabilities of Wi-Fi and cellular wireless networks.
15. What are the basic capabilities of a web server?
16. What role does CSS play in the creation of web pages?
17. Why was the development of the browser so significant to the growth of the Web?
18. What advances and features does HTML5 offer?
19. Name and describe five services currently available through the Web.
20. What has been the impact of the development of mobile apps?

PROJECTS

1. Review the *Insight on Technology* case on low earth orbit satellites. What developments have occurred since this case was written in June 2022?
2. Call or visit the websites of a cable provider, a DSL provider, and a satellite provider to obtain information on their Internet services. Prepare a brief report summarizing the features, benefits, and costs of each. Which is the fastest? What, if any, are the downsides (such as the necessity of additional equipment purchases) of selecting any of the three for Internet service?
3. Select two countries (excluding the United States), and prepare a short report describing each one's basic Internet infrastructure. Is the infrastructure public or commercial? How and where does the infrastructure connect to backbones within the United States?
4. Investigate the Internet of Things. Select one example, and describe what it is and how it works.

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CHAPTER 4

Building an E-commerce Presence: Websites, Mobile Sites, and Apps

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

4.1 Understand the questions you must ask and answer, and the steps you should take, when developing an e-commerce presence.
4.2 Explain the process that should be followed in building an e-commerce presence.
4.3 Identify and understand the major considerations involved in choosing web server and e-commerce merchant server software.
4.4 Understand the issues involved in choosing the most appropriate hardware for an e-commerce site.
4.5 Identify additional tools that can improve website performance.
4.6 Understand the important considerations involved in developing a mobile website and building mobile applications.

NEW Video Cases

See **eText Chapter 4** to watch these videos and complete activities:

4.1 Bolt: One-Click Checkout for Small and Medium-Sized Businesses

4.2 Figma: A Collaborative Web Application for UI Design

Walmart's Omnichannel Strategy:

From Supercenter to Super App

Walmart is the biggest company in the world, with around 10,500 stores worldwide, 2.3 million employees, and about $575 billion in revenue in 2021. Walmart is renowned for its everyday low prices, enormous selection, and the legendarily efficient supply chain that drives its profitability. For nearly its entire history, Walmart has been the goliath that smaller, local businesses have had to contend with to survive. However, in the world of e-commerce, Walmart occupies a very different role: the underdog.

When it comes to bricks-and-mortar retailing, Walmart is without peer. It is also bigger than Amazon, which earned $470 billion in 2021, compared to Walmart's $575 billion. But in the e-commerce space, Amazon is the unquestioned leader, with about $355 billion in U.S. retail e-commerce revenues in 2021, almost six times more than Walmart's estimated $60 billion. Amazon has a nearly 40% share of all e-commerce, with Walmart still far behind at only about 7%. Amazon is the biggest threat to Walmart's retailing dominance.

But the world's biggest company has not gotten to where it is by resting on its laurels. For the last several years, Walmart has been steadily growing its e-commerce operations. In 2018, it removed the word "Stores" from its legal corporate name, emphasizing the company's focus on becoming an omnichannel retailer. Walmart's goal is to enable its customers to shop any way they want and still get the "Walmart experience."

Walmart has a number of unique advantages in pursuing this goal. First, its name recognition is already universal. Its supercenters provide a one-stop shopping experience, with an enormous selection ranging from groceries to electronics, apparel, and home furnishings, a competitive advantage in the physical world that it wanted to continue

to leverage as it evolved into e-commerce. Walmart also has an incredible amount of resources from its bricks-and-mortar business segment to pour into its e-commerce operations. Walmart used some of those resources to jumpstart its e-commerce presence, purchasing Amazon competitor Jet.com for $3.3 billion in 2016. It also added trendy online fashion brands Bonobos, Eloquii, and Moosejaw; leading online home furnishing and décor retailer Hayneedle; and online art supplier Art.com, and acquired a controlling interest in Flipkart, India's leading e-commerce site. Lastly, 90% of the U.S. population lives within ten miles of one of Walmart's 4,700 stores, priming Walmart for omnichannel retailing.

Redesigning Walmart's website was an important part of Walmart's omnichannel strategy. For years, Walmart's website lagged behind Amazon's in ease of use, search quality, selection, and presentation. However, in 2018, Walmart undertook a bold reimagining of its flagship website. The most striking and immediately apparent difference was the emphasis on high-quality imagery and reduction of information density, such as the flood of links and product recommendations that an Amazon customer sees. Large images on the home page and individual product category landing pages depict scenes from daily life in a relatable way, showing products as they would be used in the home. Even search results pages were refocused around high-quality imagery. The site also uses more muted colors and typography than past iterations. All of these changes allow the images to be the focal point of each page. The downside of devoting so much page space to images is that the website now displays far fewer items per page. To compensate, another core component of the website is a heavy emphasis on personalization. While the site displays fewer products, those items are all very highly targeted. Walmart uses an algorithmic approach to display items that are trending in the user's geographic region, items that the user has purchased before, and items that are on sale. The redesigned site currently attracts more than 118 million monthly unique visitors.

Walmart's mobile apps are another key part of its omnichannel strategy. Walmart originally had two mobile apps: its flagship Walmart app and a separate app dedicated solely to its online grocery business. Although the separation may have initially made sense, by 2020, it had become clear that it was presenting a roadblock to the omnichannel customer experience that Walmart was hoping to achieve. It meant shoppers had to download two separate apps, and then switch between them, depending on what they were buying. Combining the two provides a much more seamless shopping experience, according to Cynthia Kleinbaum Milner, Vice President of Marketing for Walmart Plus, Online Grocery and Mobile App. At the same time, Walmart redesigned its desktop and mobile websites to further integrate Walmart Grocery into those sites. It also launched Walmart+, a subscription service similar to Amazon Prime.

According to Ming Chee, Walmart's chief product officer, Walmart is looking to foster a seamless customer experience across its physical locations, web presence, and apps. For instance, it recently rolled out a new design for its stores that included updated signage reflecting the Walmart app icon, updated in-store messaging and signage to guide customers and employees to products using the app, and more hosted checkout kiosks with contactless payment solutions to leverage its mobile app's scan-and-go functionality.

SOURCES: "About," Corporate.walmart.com, accessed April 21, 2022; "Walmart's FinTech and Super App Future Take Shape with Pair of Purchases," Pymnts.com, January 26, 2022; "How Walmart

Walmart has positioned "scan and go," which enables Walmart+ subscribers to scan items with their phones as they shop and to then use a self-checkout kiosk to checkout and pay, as a key benefit for Walmart+ subscribers. Creating features in the app that will make the store experience better has the added benefit of encouraging more customers to download and use the app.

According to Milner, the app goes through constant tweaks, iterations, and tests to ensure that shoppers are getting the best experience. For instance, in September 2021, Walmart further enhanced its app by rolling out universal search and checkout. Previously, before searching for items, shoppers still had to pick between ship-to-home or orders for pickup or delivery. The change allows shoppers to use one basket and transaction for items that get fulfilled from different locations. Now shoppers can purchase both groceries and electronics, all in one transaction.

Merging the two Walmart apps was Walmart's first step toward creating a "super app," which Walmart envisions as much more than just a shopping app. Instead, it views it as more of a lifestyle app, encompassing not only shopping but also financial services, health and wellness services, content, and more. In January 2022, Walmart took a major step toward that future, acquiring two companies that offer financial services, with plans to combine them into a Walmart startup that will launch under the name ONE. Analysts have noted that the chosen name evokes a slew of services and products under one roof or umbrella. Although the initial plan appears to focus on building a financial services app that provides a single place for consumers to manage their money, it's not hard to envision this app as just one more step along the way to the creation of a true super app.

In the meantime, Walmart's omnichannel strategy appears to be working. Its e-commerce operations have been thriving. The Covid-19 pandemic drove many consumers to online shopping, particularly for groceries, where Walmart already had a head start, due to its previous investments in online grocery delivery services and in-store and curbside pickup. Its retail e-commerce sales jumped by more than 75%, from about $30 billion in 2019, to $53 billion in 2020, and increased by another 15% in 2021, to $61 billion. If Walmart is able to deliver on its super app ambitions, it may become even more competitive with Amazon in the fight for the U.S. consumer.

Brought the Superstore into a Super App, with Cynthia Kleinbaum Milner, VP of Marketing for Walmart Plus, Online Grocery and Mobile App," Mission.org, October 14, 2021; "Walmart Boosting Grocery with App Changes, New Partnership," by Catherine Douglas Moran, Grocerydive.com, September 8, 2021; "Why Walmart Is Creating a Lifestyle 'Super App,'" by Imma Calvo, Thinkwithgoogle.com, September 2021; "Walmart Merges Main App with Grocery App," Borndigital.com, March 6, 2020; "Walmart Grocery Is Merging with Walmart's Main App and Website," by Sarah Perez, Techcrunch.com, March 5, 2020; "Exclusive: Walmart.com Redesigns as the Anti-Amazon," by Mark Wilson, Fastcodesign.com, May 3, 2018; "Walmart.com Redesign Is Live," Pymnts.com, May 3, 2018; "Walmart.com Gets a Massive Redesign," by Ezequiel Bruni, Webdesignerdepot.com, April 20, 2018; "Walmart Is Making Its Website a Little Less Like Walmart," by Sarah Nassauer, *Wall Street Journal*, April 17, 2018; "Walmart Spruces Up Website in Bid to Capture Traffic from Amazon," by Matthew Boyle, Bloomberg.com, April 17, 2018; "Walmart Will Roll Out a Cleaner, Sleeker Website in May," by Mariella Moon, Engadget.com, April 17, 2018; "Walmart to Launch a More Personalized, Redesigned Website in May," by Sarah Perez, Techcrunch.com, April 17, 2018; "Walmart.com Is Getting a New Look—and It's a Radical Change for the Company," by Hayley Peterson, Businessinsider.com, April 17, 2018.

In Chapter 3, you learned about e-commerce's technological foundation: the Internet, the Web, and the mobile platform. In this chapter, you will examine the important factors that need to be considered when building an e-commerce presence. The focus will be on the managerial and business decisions you must make before you begin and that you will continually need to make. Although building a sophisticated e-commerce presence isn't easy, today's tools are much less expensive and far more powerful than they were during the early days of e-commerce. At the same time, the proliferation of mobile devices and social networks adds complexity because you need to build a presence on three platforms: the Web, mobile, and social networks. In this chapter, we focus on small and medium-sized businesses as well as much larger businesses that serve thousands or more customers a day, or even an hour. As you will see, although the scale may be very different, the principles and considerations are basically the same.

4.1 IMAGINE YOUR E-COMMERCE PRESENCE

Before you begin to build a website or app, there are some important questions you will need to think about and answer. The answers to these questions will drive the development and implementation of your e-commerce presence.

WHAT'S THE IDEA? (THE VISIONING PROCESS)

Before you can plan and actually build an e-commerce presence, you need to have a vision of what you hope to accomplish and how you hope to accomplish it. The vision includes not only a statement of mission but also an identification of the target audience, a characterization of the market space, a strategic analysis, a marketing matrix, and a development timeline. It starts with a dream and concludes with a timeline and preliminary budget for development.

If you examine any successful e-commerce company, you can often get a good idea about the company's mission by looking at the home page of the company's website. If the company is a public company, you can usually also find a succinct statement of its vision or mission in the reports it files with the Securities and Exchange Commission. For Amazon, it's to become the Earth's most customer-centric company. For Facebook, it's to give people the power to build community and bring the world closer together. For Google, it's to be a place of creativity and innovation that uses its technical expertise to tackle big problems. The e-commerce presence you want to build may not have such all-encompassing ambitions, but a succinct statement of mission, purpose, and direction is the key factor in driving the development of your project. For instance, the mission of The Knot is to be a comprehensive, one-stop wedding planning solution.

WHERE'S THE MONEY: BUSINESS AND REVENUE MODEL

Once you have defined your vision and mission statement, you need to start thinking about where the money will be coming from and develop a preliminary idea of your business and revenue models. You don't need detailed revenue and cost projections at

this point. Instead, you need a general idea of how your business will generate revenues. The basic choices have been described in Chapter 2. Some basic business models include online retailer (e-tailer), content provider, transaction broker, market creator, service provider, community provider (social network), and portal.

The primary revenue model alternatives are advertising, subscriptions, transaction fees, sales, and affiliate revenue. There's no reason to adopt a single business or revenue model, and in fact, many firms have multiple models. For instance, at The Knot, you will find ads, affiliate relationships, and sponsorships from major creators of wedding products and services, including a directory of local wedding planners, all of which produce revenue for The Knot.

WHO AND WHERE IS THE TARGET AUDIENCE?

Without a clear understanding of your target audience, you will not be able to develop a successful e-commerce presence. There are two questions here: Who is your target audience, and where can you best reach them? Your target audience can be described in a number of ways: demographics, behavior patterns (lifestyles), current consumption patterns (online vs. offline purchasing), digital usage patterns, content creation preferences (preferred social media venues), and buyer personas (profiles of your typical customer).

Understanding the demographics of your target audience is usually the first step. Demographic information includes age, income, gender, and location. In some cases, this information may be obvious, and in others, much less so. For instance, Harley-Davidson sells motorcycles to a very broad demographic range of varying ages, incomes, and locations. Although most of the purchasers are middle-aged men, many of the men ride with women, and the Harley-Davidson website has a collection of women's clothing and several web pages devoted to women riders. While the majority of men who purchase Harley-Davidsons have modest incomes, a significant group of purchasers are professionals with above-average incomes. Hence, the age and income demographic target is quite broad. What ties Harley-Davidson riders together is not their shared demographics, but their love of the motorcycles and the brand, and the lifestyle associated with touring the highways of America on a powerful motorcycle that sounds like a potato popper. In contrast, a company like The Knot is aimed at couples in the 18-year-old-to-34-year-old demographic who are in varying stages of getting married, with lifestyles that include shopping online, using smartphones and tablets, downloading apps, and using social media. This audience is very familiar with technology and often uses Instagram, TikTok, and/or Pinterest to find ideas for fashion. A "typical" visitor to The Knot might be a 28-year-old woman who has an engagement ring, is just starting the wedding planning process, has an income of $65,000, lives in the Northeast, and is interested in a beach wedding. There are, of course, other "typical" profiles, and you will need to develop a detailed description for each one.

WHAT IS THE BALLPARK? CHARACTERIZE THE MARKETPLACE

The chances of your success will depend greatly on the characteristics of the market you are about to enter—and not just on your entrepreneurial brilliance. Enter a declining market filled with strong competitors, and you will multiply your chances of failure.

Enter a market that is emerging, growing, and has few competitors, and you stand a better chance. Enter a market where there are no players, and you will either be rewarded handsomely with a profitable monopoly on a successful product no one else thought of (Apple) or be quickly forgotten because there isn't a market for your product at this point in time (the Franklin e-book reader circa 1999).

Features of the marketplace to focus on include the demographics of the market and how an e-commerce presence fits into the market. In addition, you will want to know about the structure of the market: competitors, suppliers, and substitute products.

What are the features of the marketplace you are about to enter? Is the market growing, or receding in size? If it's growing, among which age and income groups? Is the marketplace shifting from offline to online delivery? Is there a special role for a mobile presence in this market? What percentage of your target audience uses a website, smartphone, or tablet? What about social networks? What's the buzz on products like yours? Are your potential customers on Facebook, Instagram, TikTok, Twitter, or Pinterest talking about the products and services you want to offer?

The structure of the market is described in terms of your direct competitors, suppliers, and substitute products. You will want to make a list of the top five or ten competitors and try to describe their market share and distinguishing characteristics. You need to find out everything you can about your competitors. What's the market buzz? How many unique monthly visitors (UMVs) do their websites have? How many Facebook, Instagram, Twitter, TikTok, and/or Pinterest followers? If they have an app, how many times has it been downloaded? You can find online services (some of them free) that will measure the number of online conversations about your competitors and the total share of Internet attention each of your competitors receives. Do your competitors have a special relationship with their suppliers that you may not have access to? Exclusive marketing arrangements would be one example of a special supplier relationship. Finally, are there substitutes for the products and services you intend to offer?

WHERE'S THE CONTENT COMING FROM?

Websites are like books: They're composed of a lot of pages that have content ranging from text to graphics, to photos, and to videos. This content is what search engines catalog as they crawl through all the new and changed web pages on the Internet. The content is why your customers visit your site and either purchase things or look at ads that generate revenue for you. Therefore, the content is the single most important foundation for your revenue and ultimate success.

There are generally two kinds of content: static and dynamic. Static content is text and images that do not frequently change, such as product descriptions, photos, or text that you create to share with your visitors. Dynamic content is content that changes regularly, say, daily or hourly. Dynamic content can be created by you or, increasingly, by users. User-generated content has a number of advantages: It's free, it engages your customer fan base, and search engines are more likely to catalog your site if the content is changing. Other sources of content, especially photos, are external websites that aggregate content such as Pinterest.

KNOW YOURSELF: CONDUCT A SWOT ANALYSIS

SWOT analysis describes a firm's strengths, weaknesses, opportunities, and threats

A **SWOT analysis** is a simple but powerful method for strategizing about your business and understanding where you should focus your efforts. In a SWOT analysis, you describe your strengths, weaknesses, opportunities, and threats (SWOT). In the example SWOT analysis shown in **Figure 4.1**, you will see a profile of a typical startup venture that includes a unique approach to an existing market, a promise of addressing unmet needs in this market, and the use of newer technologies (social and mobile platforms) that older competitors may have overlooked. There are many opportunities to address a large market with unmet needs as well as the potential to use the initial website as a home base and spin off related sites, leveraging the investment in design and technology. But there are also weaknesses and threats. Lack of financial and human resources are typically the biggest weakness of startup companies. Threats include competitors that could develop the same capabilities as you, and low market entry costs, which might encourage many more startups to enter the marketplace.

Once you have conducted a SWOT analysis, you can consider ways to overcome your weaknesses and build on your strengths. For instance, you could consider hiring or partnering to obtain technical and managerial expertise and look for financing opportunities (including friends and relatives).

FIGURE 4.1 SWOT ANALYSIS

STRENGTHS
Current sites do not address market needs • Unique approach • Easy navigation • Better personalization • Customer base growing • High-value market segment • Superior social strategy

WEAKNESSES
Limited financial resources • No prior online experience • No existing user base • No media attention • No Web design expertise • No computer background

OPPORTUNITIES
Ability to address large market with unmet needs • Potential to capture significant share of this market • Potential to develop related sites

THREATS
Approach could be copied by competitors • Advertisers may not want to try a new site • Rapid pace of technological development • Low market entry costs

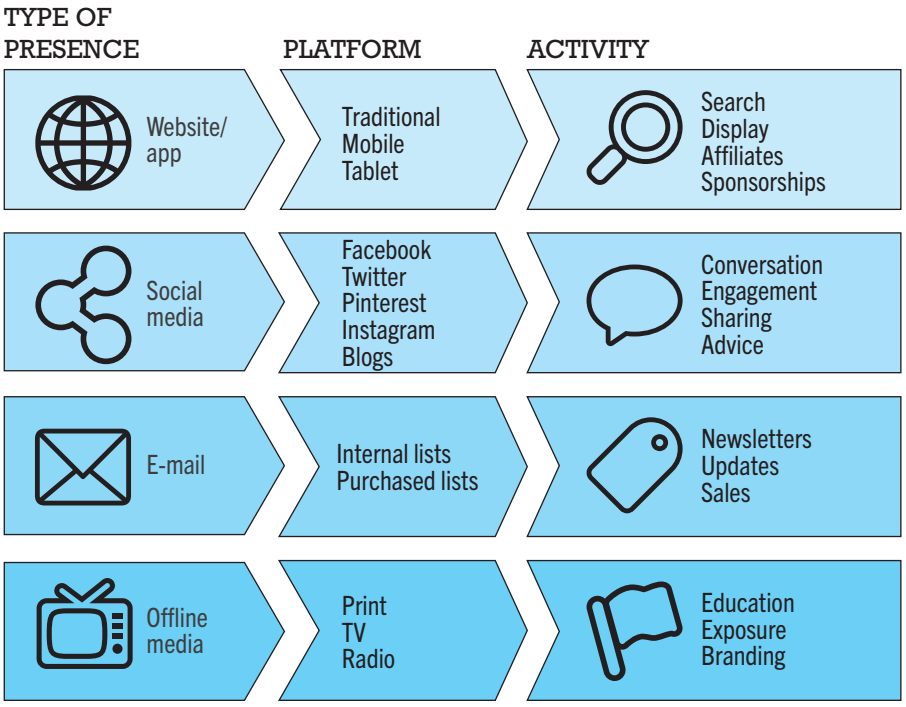
A SWOT analysis describes your firm's strengths, weaknesses, opportunities, and threats

DEVELOP AN E-COMMERCE PRESENCE MAP

E-commerce has moved from being a desktop-centric activity to a mobile-based activity as well. While around 60% of e-commerce retail is still generated by purchases made from a desktop/laptop computer, increasingly smartphones and tablets are being used for purchasing. Mobile devices are being used by a majority of Internet users in the United States to shop for goods and services, explore purchase options, look up prices, and access social networks. Your potential customers use these various devices at different times during the day and involve themselves in different conversations depending on what they are doing—touching base with friends on Facebook, viewing videos on TikTok or photos on Instagram, tweeting, or reading an online news article. Each of these are "touch points" where you can meet the customer, and you have to think about how you develop a presence in these different virtual places. **Figure 4.2** provides a roadmap to the platforms and related activities you will need to think about when developing your e-commerce presence.

Figure 4.2 illustrates four different kinds of e-commerce presence: website/app, social media, e-mail, and offline media. For each of these types there are different platforms that you will need to address. For instance, in the case of websites and/or apps, there are three different platforms: traditional desktop/laptops, smartphones, and tablets,

FIGURE 4.2 E-COMMERCE PRESENCE MAP



An e-commerce presence requires firms to consider the four different kinds of presence and the platforms and activities associated with each type of presence.

each with different capabilities. And for each type of e-commerce presence, there are related activities you will need to consider. For instance, in the case of websites and apps, you will want to engage in search engine marketing, display ads, affiliate programs, and sponsorships. Offline media, the fourth type of e-commerce presence, is included here because many firms use multiplatform or integrated marketing in which print, television, and/or radio ads refer customers to websites and apps. View the Figure 4.2 video in the eText for an animated and more detailed discussion of this figure. The marketing activities in Figure 4.2 are also described in much greater detail in Chapters 6 and 7.

DEVELOP A TIMELINE: MILESTONES

Where would you like to be a year from now? It's a good idea for you to have a rough idea when you begin of the time frame for developing your e-commerce presence. You should break your project down into a small number of phases that can be completed within a specified time. Six phases are usually enough detail at this point. **Table 4.1** illustrates a one-year timeline for the development of a startup e-commerce company.

Note that this example timeline defers the development of a mobile plan until after a website and social media plan have been developed and implemented. There is a growing trend, however, to flip this timeline around and to begin with a mobile plan instead (sometimes referred to as mobile-first design). Mobile-first design has both advantages and disadvantages that will be examined more fully in Section 4.6. In addition, many small businesses begin with a social media plan before they develop a website.

It is also important to note that it is possible to launch an e-commerce presence in a much shorter time frame. For example, consulting firm McKinsey & Company reported the experience of a European retail chain with around 1,000 physical stores that previously did not have an e-commerce presence. By being pragmatic (launching in only one region with a limited offering), the firm was able to launch a functioning and successful e-commerce presence within just 13 weeks (Arora et al., 2020).

TABLE 4.1 E-COMMERCE PRESENCE TIMELINE

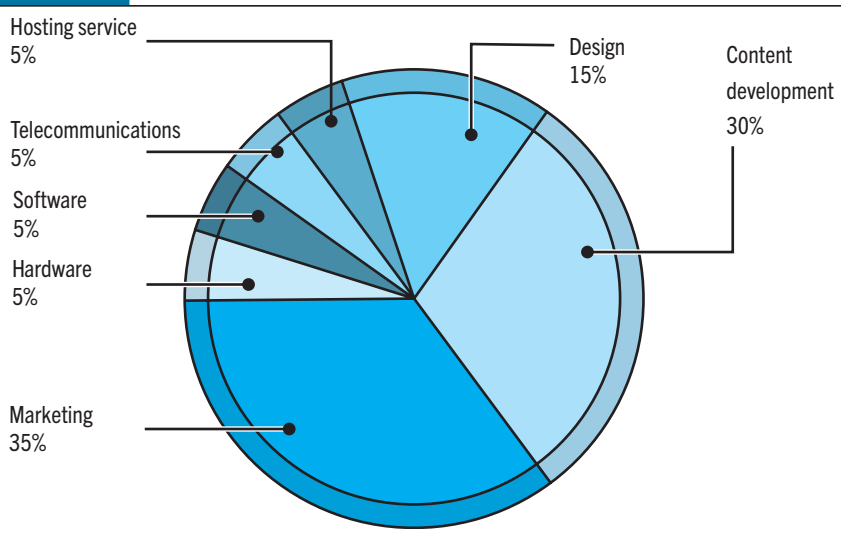
PHASE	ACTIVITY	MILESTONE
Phase 1: Planning	Envision e-commerce presence; determine personnel	Mission statement
Phase 2: Website development	Acquire content; develop a site design; arrange for hosting the site	Website plan
Phase 3: Web implementation	Develop keywords and metatags; focus on search engine optimization; identify potential sponsors	A functional website
Phase 4: Social media plan	Identify appropriate social platforms and content for your products and services	A social media plan
Phase 5: Social media implementation	Develop Facebook, Instagram, TikTok, Twitter, and Pinterest presence	Functioning social media presence
Phase 6: Mobile plan	Develop a mobile plan; consider options for porting your website to mobile devices	A mobile plan

HOW MUCH WILL THIS COST?

It's too early in the process to develop a detailed budget for your e-commerce presence, but it is a good time to develop a preliminary idea of the costs involved. How much you spend on a website, for instance, depends on what you want it to do. Simple websites can be built and hosted with a first-year cost of a few hundred to a few thousand dollars if you use a pre-built template and do the work yourself. A more reasonable budget for a small startup seeking a more sophisticated and custom website created by a web designer/programmer might be $5,000 to $10,000. In contrast, the websites of large firms that offer high levels of interactivity and linkage to corporate systems can cost several hundred thousand to millions of dollars a year to create and operate. Large firms often outsource their web development and hosting entirely, although many large firms have recently changed and brought the entire web effort in-house (see the closing case study, *Dick's Sporting Goods: Pivoting Pays Off*).

While how much you spend to build a website depends on how much you can afford and, of course, the size of the opportunity, **Figure 4.3** provides some idea of the relative size of various website costs. In general, the cost of hardware, software, and telecommunications for building and operating a website has fallen dramatically (by more than 50%) in the last decade, making it possible for even very small entrepreneurs to build fairly sophisticated sites at an affordable price. At the same time, while technology has lowered the costs of system development, the costs of marketing, content development, and design have risen to make up more than half of typical website budgets. The longer-term costs also include site and system maintenance, which are not included here. The costs of developing a mobile site and apps are discussed in Section 4.6.

FIGURE 4.3 COMPONENTS OF A WEBSITE BUDGET



While hardware and software costs have fallen dramatically, websites have significant design, content development, and marketing costs.

4.2 BUILDING AN E-COMMERCE PRESENCE: A SYSTEMATIC APPROACH

Once you have developed a vision of the e-commerce presence you want to build, it's time to start thinking about how to build and implement that presence. Building a successful e-commerce presence requires a keen understanding of business, technology, and social issues, as well as a systematic approach. E-commerce is just too important to be left totally to information technology specialists and programmers.

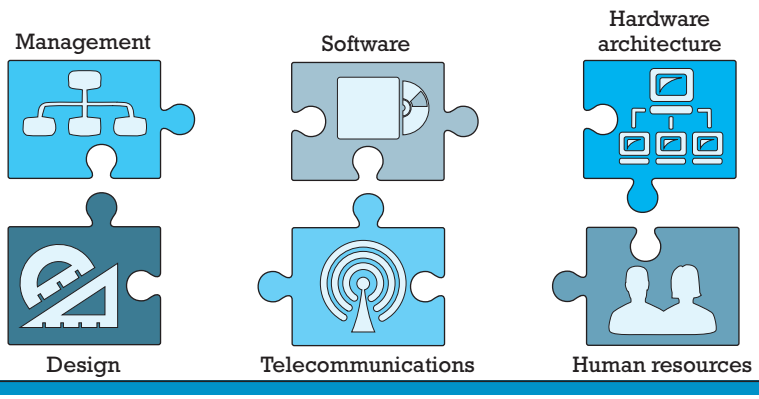
The two most important challenges are (1) developing a clear understanding of your business objectives and (2) knowing how to choose the right technology to achieve those objectives. The first challenge requires you to build a plan for developing your firm's presence. The second challenge requires you to understand some of the basic elements of e-commerce infrastructure. Let the business drive the technology.

Even if you decide to outsource the development effort and operation to a service provider, you will still need to have a development plan and some understanding of the basic e-commerce infrastructure issues such as cost, capability, and constraints. Without a plan and a knowledge base, you will not be able to make sound decisions about e-commerce within your firm.

Let's assume you are a manager for a medium-sized industrial parts firm in the United States. You have been given a budget of $100,000 to develop a website for the firm. The purpose will be to sell and service the firm's customers, who are mostly small machine and metal fabricating shops, and to engage your customers through the website, perhaps via a blog and user forum. Where do you start? In the following sections, we will examine developing an e-commerce website and then, at the end of the chapter, discuss some of the more specific considerations involved in developing a mobile website and building mobile applications.

First, you must be aware of the main areas where you will need to make decisions (see **Figure 4.4**). On the organizational and human resources fronts, you will have to bring together a team of individuals who possess the skill sets needed to build and manage a successful e-commerce presence. This team will make the key decisions about

FIGURE 4.4 FACTORS TO CONSIDER IN DEVELOPING AN E-COMMERCE PRESENCE



Building an e-commerce presence requires that you systematically consider the many factors that go into the process.

business objectives and strategy, technology, design, and social and information policies. The entire development effort must be closely managed if you hope to avoid the disasters that have occurred at some firms.

You will also need to make decisions about hardware, software, and telecommunications infrastructure. The demands of your customers should drive your choices of technology. Your customers will want technology that enables them to easily find what they want, view the product, purchase the product, and then receive the product from your warehouses quickly. You will also have to carefully consider design. Once you have identified the key decision areas, you will need to think about a plan for developing the project. There are a number of different methodologies for building information systems such as websites. One of the most traditional methods is the systems development life cycle, described in the following section.

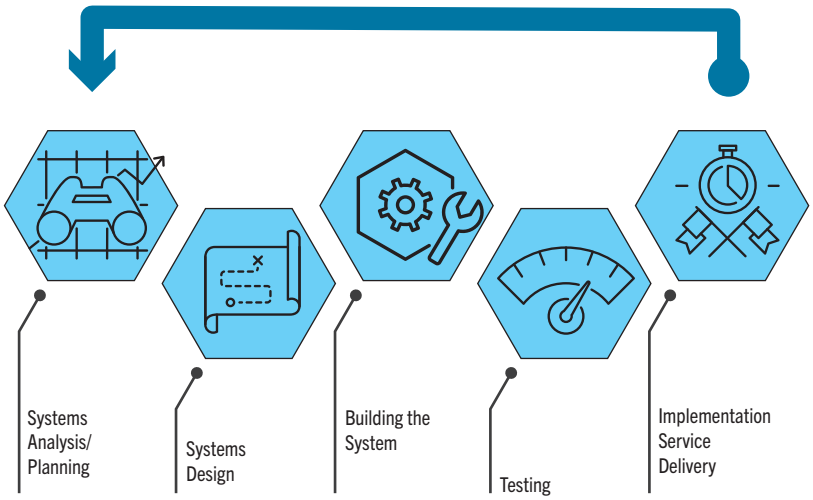
THE SYSTEMS DEVELOPMENT LIFE CYCLE

systems development life cycle (SDLC) a methodology for understanding the business objectives of any system and designing an appropriate solution

The **systems development life cycle (SDLC)** is a methodology for understanding the business objectives of any system and designing an appropriate solution. Adopting a life cycle methodology does not guarantee success, but it is far better than having no plan at all. The SDLC method also helps in creating documents that communicate objectives, important milestones, and the uses of resources to management. **Figure 4.5** illustrates the five major steps involved in the systems development life cycle:

- Systems analysis/planning
- Systems design

FIGURE 4.5 SYSTEMS DEVELOPMENT LIFE CYCLE



Best Practices

Continuous availability 99%+ ● Design for scalability ● Build in management for end-to-end delivery ● Plan for growth ● Design system for high-speed performance ● Understand and optimize workload on system

The systems development life cycle (SDLC) has five major steps: systems analysis/planning, systems design, building the system, testing, and implementation and maintenance.

- Building the system
- Testing
- Implementation and maintenance

Systems Analysis/Planning: Identify Business Objectives, System Functionality, and Information Requirements

In the systems analysis/planning step of the SDLC, you try to answer the question, "What do we want this website or app to do for our business?" The key point is to let the business decisions drive the technology, not the reverse. This will ensure that your technology platform is aligned with your business. We will assume here that you have identified a business strategy and chosen a business model to achieve your strategic objectives (see Chapter 2). But how do you translate your strategies, business models, and ideas into a working e-commerce website?

One way to start is to identify the specific business objectives for your site and then to develop a list of system functionalities and information requirements. **Business objectives** are simply capabilities you want your site to have.

System functionalities are types of information systems capabilities required to achieve your business objectives. The **information requirements** for a system are the information elements that the system needs to achieve the business objectives.

Table 4.2 describes some basic business objectives, system functionalities, and information requirements for a typical e-commerce website. As shown in the table, there are ten basic business objectives that an e-commerce website must deliver.

business objectives capabilities you want your site to have

system functionalities the types of information systems capabilities required to achieve your business objectives

information requirements the information elements that the system needs to achieve the business objectives

TABLE 4.2 SYSTEM ANALYSIS: BUSINESS OBJECTIVES, SYSTEM FUNCTIONALITIES, AND INFORMATION REQUIREMENTS FOR A TYPICAL E-COMMERCE WEBSITE

BUSINESS OBJECTIVE	SYSTEM FUNCTIONALITY	INFORMATION REQUIREMENTS
Display goods.	Digital catalog	Dynamic text and graphics
Provide product information (content).	Product database	Product description, stocking numbers, inventory levels
Personalize/customize product.	Customer on-site tracking	Website log for every customer visit; data-mining capability to identify common customer paths and appropriate responses
Engage customers in conversations.	On-site blog; user forums	Customer comments captured by software with blogging and community forum functionality
Execute a transaction.	Shopping cart/payment system	Secure credit card clearing; multiple payment options
Accumulate customer information.	Customer database	Name, address, phone, and e-mail for all customers; online customer registration
Provide after-sale customer support.	Sales database	Customer ID, product, date, payment, shipment date
Coordinate marketing/advertising.	Ad server, e-mail server, e-mail, campaign manager, ad banner manager	Site behavior log of prospects and customers linked to e-mail and banner ad campaigns
Understand marketing effectiveness.	Site tracking and reporting system	Number of unique visitors, pages visited, and products purchased, identified by marketing campaign
Provide production and supplier links.	Inventory management system	Product and inventory levels, supplier ID and contact, order quantity data by product

These objectives must be translated into a description of system functionalities and ultimately into a set of precise information requirements. The specific information requirements for a system typically are defined in much greater detail than Table 4.2 indicates. To a large extent, the business objectives of an e-commerce website are not that different from those of an ordinary retail store. The real difference lies in the system functionalities and information requirements. In an e-commerce website, the business objectives must be provided entirely in digital form without buildings or salespeople, 24 hours a day, 7 days a week.

System Design: Hardware and Software Platforms

Once you have identified the business objectives and system functionalities and have developed a list of precise information requirements, you can begin to consider just how all this functionality will be delivered. You must come up with a **system design specification**—a description of the main components in the system and their relationship to one another. The system design itself can be broken down into two components: a logical design and a physical design. A **logical design** includes a data flow diagram that describes the flow of information at your e-commerce site, the processing functions that must be performed, and the databases that will be used. The logical design also includes a description of the security and emergency backup procedures that will be instituted and the controls that will be used in the system.

system design specification
a description of the main components in a system and their relationship to one another

logical design
describes the flow of information at your e-commerce site, the processing functions that must be performed, the databases that will be used, the security and emergency backup procedures that will be instituted, and the controls that will be used in the system

A **physical design** translates the logical design into physical components. For instance, the physical design details the specific model of server to be purchased, the software to be used, the size of the telecommunications link that will be required, the way the system will be backed up and protected from outsiders, and so on.

physical design
translates the logical design into physical components

Figure 4.6(a) presents a data flow diagram for a simple high-level logical design for a very basic e-commerce website, while **Figure 4.6(b)** shows the corresponding physical design. Each of the main processes can be broken down into lower-level designs that are much more precise in identifying exactly how the information flows and what equipment is involved.

Building the System: In-House versus Outsourcing

Once you have a clear idea of both the logical and the physical designs for your site, you can begin considering how to actually build the site. You have many choices, and much depends on the amount of money you are willing to spend. Choices range from outsourcing everything (including the actual systems analysis and design) to building everything yourself (in-house). **Outsourcing** involves hiring an outside vendor to provide the services involved in building the site rather than using in-house personnel. You also have a second decision to make: Will you host (operate) the site on your firm's own servers or will you outsource the hosting to a web host provider? These decisions are independent of each other, but they are usually considered at the same time. There are some vendors who will design, build, and host your site, while others will either build or host (but not both). **Figure 4.7** on page 192 illustrates the alternatives.

outsourcing
hiring an outside vendor to provide services rather than using in-house personnel

Build Your Own versus Outsourcing Let's take the building decision first. If you elect to build your own website, there are a range of options. Unless you are fairly skilled, using a pre-built template to create the website may be the best choice. A number of

FIGURE 4.6 A LOGICAL AND A PHYSICAL DESIGN FOR A SIMPLE WEBSITE

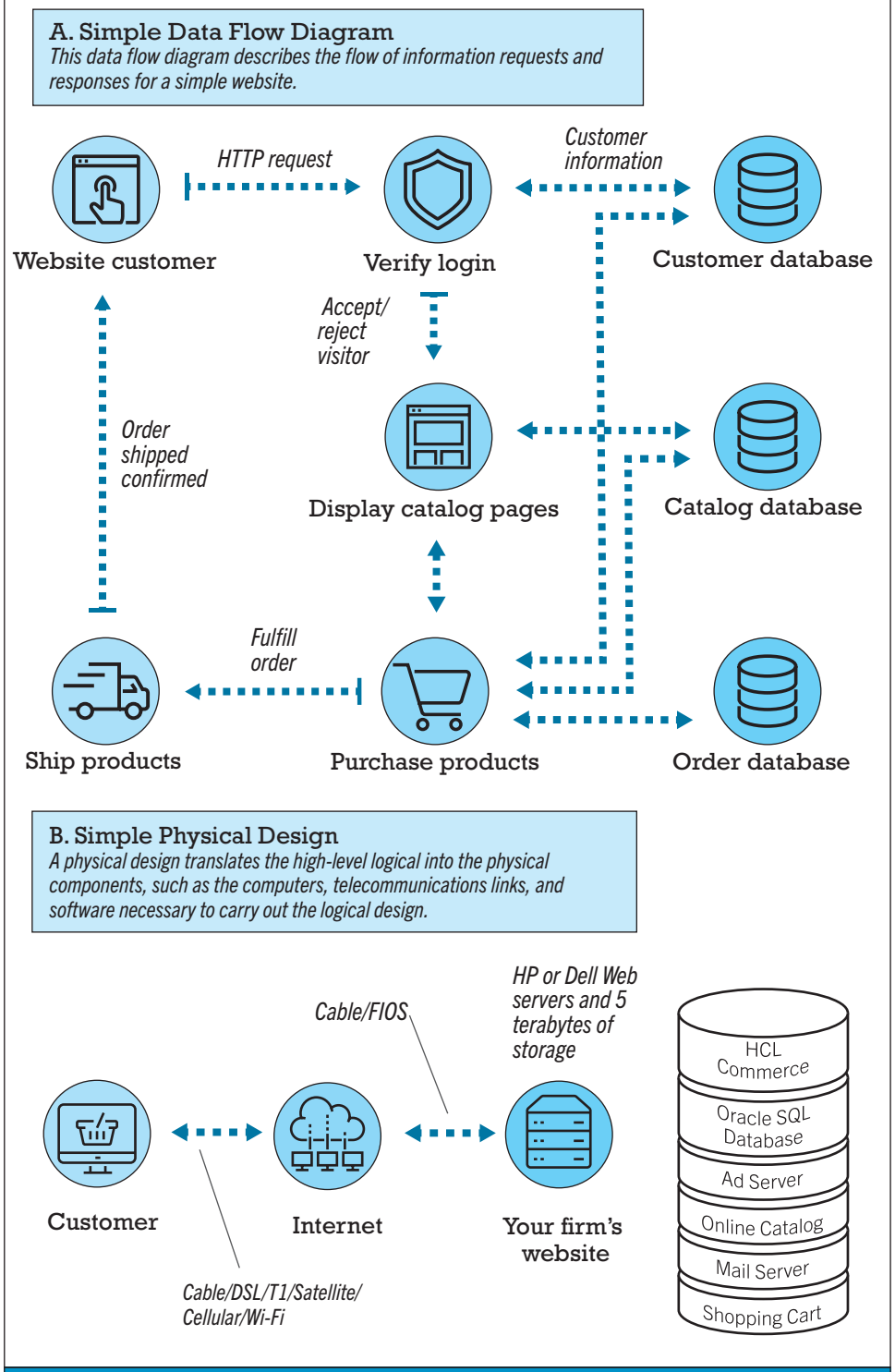


FIGURE 4.7 CHOICES IN BUILDING AND HOSTING

HOSTING THE SITE	BUILDING THE SITE: In-house	BUILDING THE SITE: Outsource
In-house	COMPLETELY IN-HOUSE Build: In Host: In	MIXED RESPONSIBILITY Build: Out Host: In
Outsource	MIXED RESPONSIBILITY Build: In Host: Out	COMPLETELY OUTSOURCED Build: Out Host: Out

You have a number of alternatives to consider when building and hosting an e-commerce site.

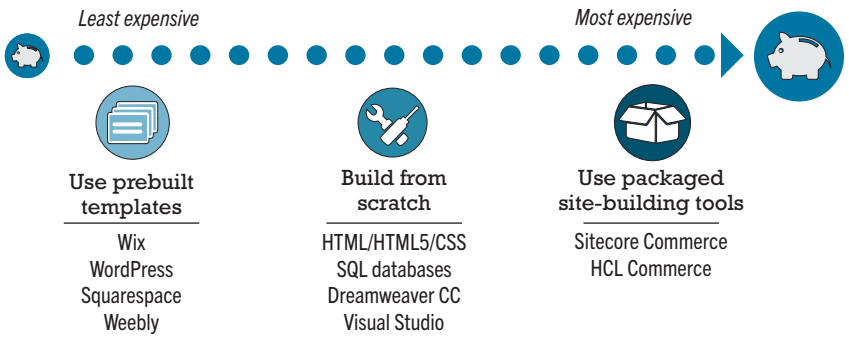
companies, such as WordPress, Wix (see the *Insight on Business* case), Squarespace, Shopify, Square, and Weebly, provide inexpensive and easy-to-use website-building tools. All of these companies also provide access to built-in e-commerce functionality. However, if you do so, you will be limited to the "look and feel" and functionality provided by the templates and infrastructure supplied by these vendors.

If you want more customization than a pre-built template can provide and have some programming experience, you can build the website yourself. Here, too, there are a variety of options. You can choose to build the site truly "from scratch," using HTML/HTML5 and CSS (see Chapter 3) and adding interactivity with JavaScript and other programming tools (see Section 4.5). You can also use web development tools such as Adobe Dreamweaver CC and Microsoft Visual Studio, which enable developers to quickly create websites. On a larger, enterprise-wide scale, companies may choose to use top-of-the-line, prepackaged site-building tools such as Sitecore Commerce or HCL Commerce (formerly IBM WebSphere Commerce), which enable companies to create a sophisticated e-commerce presence truly customized to their specific needs. **Figure 4.8** illustrates the spectrum of tools available. We will look more closely at the variety of e-commerce software available in Section 4.3.

The decision to build a website on your own has a number of risks. Given the complexity of features such as shopping carts, credit card authentication and processing, inventory management, and order processing, the costs involved are high, as are the risks of doing a poor job. You will be reinventing what other, specialized firms have already built, and your staff may face a long, difficult learning curve, delaying your entry to market. Your efforts could fail. On the positive side, you may be better able to build a website that does exactly what you want, and, more importantly, to develop the in-house knowledge to allow you to change the site rapidly if necessary due to a changing business environment.

If you choose more expensive site-building packages, you will be purchasing state-of-the-art software that is well tested. You could get to market sooner. However, to make a sound decision, you will have to evaluate many different packages, and this can take a long time. You may have to modify the package to fit your business needs and

FIGURE 4.8 THE SPECTRUM OF TOOLS FOR BUILDING YOUR OWN E-COMMERCE SITE



perhaps hire additional outside vendors to do the modifications. Costs rise rapidly as modifications mount. A $4,000 package can easily become a $40,000 to $60,000 development project.

In the past, bricks-and-mortar retailers in need of an e-commerce site typically designed the site themselves (because they already had the skilled staff in place and had extensive investments in information technology such as databases and telecommunications). However, as web applications have become more sophisticated, larger retailers today rely heavily on vendors to provide sophisticated website capabilities while also maintaining a substantial internal staff. Medium-sized startups will often purchase a website design and programming expertise from vendors. Small firms seeking simple e-commerce storefronts typically use templates like those provided by WordPress, Wix, Squarespace, and Weebly (see *Insight on Business: Wix Makes Creating Websites Easy*).

Host Your Own versus Outsourcing Now let's look at the hosting decision. Few small to medium-sized businesses host their own websites anymore. Most choose to outsource hosting, which means that the hosting company is responsible for ensuring the site is "live," or accessible, 24 hours a day. By agreeing to a monthly fee, the business need not concern itself with many of the technical aspects of setting up a web server and maintaining it, telecommunications links, nor with staffing needs.

Larger firms may instead choose **co-location**: The firm purchases or leases one or more web servers (and has total control over their operation) but locates the servers in a vendor's physical facility. The vendor maintains the facility, communications lines, and the machinery. Co-location has expanded with the spread of virtualization, in which one server has multiple processors and can operate multiple websites at once with multiple operating systems. In this case, a firm does not buy the server but rents its capabilities on a monthly basis, usually at a fraction of the cost of owning the server itself. There is an extraordinary range of prices for co-location, ranging from $4.95 a month to several hundred thousand dollars per month, depending on the size of the website, bandwidth, storage, and support requirements.

co-location
a firm purchases or leases one or more web servers (and has total control over their operation) but locates the servers in a vendor's physical facility. The vendor maintains the facility, communications lines, and the machinery

INSIGHT ON BUSINESS

WIX MAKES CREATING WEBSITES EASY

With so many big companies dominating the e-commerce scene, you may wonder if there's a chance for the "little guy" anymore. The answer is yes: There are still billions left in potential online retail sales, with additional money to be made from advertising revenues. And today, in contrast to the earlier dot-com era, startups have access to inexpensive technology and social media that enable them to start an e-commerce business quickly and affordably.

Wix is one example of such technology. Founded in 2006 on the premise that the Internet should be accessible to everyone, Wix is a cloud-based web development platform based on HTML5. It provides a variety of tools that allow entrepreneurs and small and medium-sized businesses to create their own websites with a full suite of features, including blogs, online stores, and mobile compatibility. Wix's typical customers are the "little guys" without website-coding experience, who are hoping to harness tools traditionally available only to bigger companies.

Wix provides both free as well as premium plans. Its free offerings include access to a variety of web creation tools. The first, Wix ADI, enables users to create a complete and personalized website tailored to their specific needs in just minutes. Wix ADI begins with basic information input by the user and then uses artificial intelligence to create the website. Wix Editor is a drag-and-drop visual development and website-editing tool with hundreds of templates, graphics, image galleries, and fonts. A third tool, Editor X, provides more advanced design and layout capabilities. For even more advanced functionality, Wix offers Velo by Wix, a powerful no-code/low-code development platform. Velo combines Wix ADI, Wix Editor, and Editor X with a powerful set of development capabilities. Users can design the front end of the website and then use Velo to add advanced functionality and capabilities to the back end, such as the ability to use databases to manage content and APIs to connect with external services. Velo provides an all-in-one platform, hosted on the Wix cloud, that allows users to spend their time on creation, rather than on complicated setup and maintenance. These capabilities are coupled with the Wix OS backend to manage all operational aspects of the website. Wix also provides free web hosting through a Wix domain and enables users to optimize their websites for viewing on mobile devices.

In addition, Wix provides a relatively inexpensive premium plan to those who want to create an e-commerce presence. Its Wix Stores offering allows users to create, design, and manage an online store to sell physical or digital products online and accept a variety of payment types using an integrated shopping cart application. Wix also offers a number of specialized tools for specific types of businesses, such as Wix Restaurants, Wix Fitness, Wix Music, Wix Photography, Wix Video, and more. Wix currently supports more than 700,000 active e-commerce stores.

The ability to quickly and inexpensively create an online presence proved to be a significant help to small businesses impacted by the Covid-19 pandemic, many of whom had to quickly pivot from their traditional methods of doing business to e-commerce. For instance, Mai Dinh, the owner of a nail and lash salon and training academy in Los Angeles, California, is one such example. Dinh had already used Wix to create websites for her salon and training academy. When she was forced to close her

premises, Dinh turned to Wix's e-commerce offerings and built an online store, which she called House of Suppliez, in just two days. Before the pandemic, she had never sold anything online. At first, she had just three types of items to sell: nail kits, pedicure kits, and lash kits. Dinh was shocked when she booked more than $300,000 in sales in just seven days. House of Suppliez is now a thriving online beauty supply company, with an annual revenue of more than $1 million.

Robert Plante Greenhouses (RPG) is another example. When business shut down in the spring of 2020, it was at an especially difficult time for a plant nursery because springtime is when nurseries tend to do a large percentage of their business. Like so many other businesses, RPG had to pivot to selling plants online, a particularly challenging task, as gardeners typically want to see, touch, and smell the plants they are buying. RPG already had a functioning website, but it had to be quickly updated to drive orders that could be picked up in store or curbside. In addition, plants are a perishable item, with new shipments arriving daily, making it important to be able to easily share updated inventory with customers. Wix's platform enabled RPG to quickly reorganize its website into categories of plants, such as evergreens, bulbs, perennials, annuals, and succulents, allowing customers to filter by the most recently listed offerings.

Evolve, a trendy men's fashion boutique in Somerville, New Jersey, was growing smoothly until March 2020, when the Covid-19 pandemic closed its doors. RanD Pitts, its owner, had previously used Wix to establish a basic online presence for Evolve but was not yet selling any of its products online. Pitts terms himself an "old school bricks-and-mortar guy," but Wix's various e-commerce tools enabled him to create a fully operational online store within just one week, featuring custom product galleries, an online ordering system, online payment methods, online shipping, and curbside pickup. Evolve's reach now extends far beyond the small New Jersey suburb in which it is located.

Adreana Alvarez was working at a Fortune 500 company when, frustrated with the quality of name-brand exercise leggings, she decided to create her own as a side business. She started an online store called Love Her on Wix in 2019. That side business became her sole source of income when she was laid off at the beginning of the pandemic. A major turning point came when Alvarez began to delve into Wix's built-in analytics tools. Alvarez had assumed that most of her customers were from California, where she was based. To her surprise, Wix's analytics revealed that the majority were from the Midwest and Texas and using mobile devices to access her shop. This data helped to shape her marketing to better reflect her customers' demographics. Today, Love Her has moved out of Alverez's living room into a warehouse, and she employs a growing team to help keep operations moving smoothly. Love Her currently fulfills hundreds of orders a day and has surpassed the million-dollar mark in sales.

Wix is just one example of a larger trend toward leaner business models that rely on outside help for many business functions. Many startup firms have found that cloud computing and social marketing greatly reduce the costs of starting a company. Market intelligence, public relations, and even design services can be found online for a fraction of the cost of traditional service firms. Today, establishing a viable e-commerce presence is feasible for even the smallest of businesses.

SOURCES: "Hitting $1 Million: Two Founders Describe What It Took," by Brielle Gordon, Wix.com, May 12, 2022; "Wix.com Ltd. Form 20-F for the fiscal year ended December 31, 2021." Sec.gov, April 1, 2022; "$300K in 7 Days: Building a Million Dollar Beauty Subscription Business," Wix.com, October 8, 2021; "How to Make Fertile Soil for Online Growth," Wix.com, May 20, 2021; "Evolve Clothing Gallery in Somerville Thrives During Pandemic," by Cheryl Makin, Mycentraljersey.com, July 19, 2020; "'I Went from Selling to My Town to Selling Nationwide in 1 Week'," Wix.com, May 26, 2020.

TABLE 4.3	KEY PLAYERS: HOSTING/CO-LOCATION/CLOUD SERVICES
Amazon Web Services (AWS)	Hostway
Bluehost	IBM Cloud
Digital Realty Trust	Liquid Web
Equinix	Microsoft Azure
GoDaddy	Rackspace
Google Cloud	Squarespace

While co-location involves renting physical space for your hardware, you can think of using a cloud service provider (see Chapter 3) as renting virtual space in your provider's infrastructure. Cloud services are rapidly replacing co-location because they are less expensive and arguably more reliable. Unlike with co-location, your firm does not own the hardware. Cloud service providers offer a standardized infrastructure, virtualization technology, and a pay-as-you-go billing system. See **Table 4.3** for a list of some of the major hosting/co-location/cloud providers.

Hosting, co-location, and cloud services have become a commodity and a utility. Costs are driven by very large providers (such as Amazon, Microsoft, IBM, and Google), who can achieve large economies of scale by establishing huge "server farms" located strategically around the country and the globe. This means the cost of pure hosting has fallen as quickly as the fall in server prices. Telecommunications costs have also fallen. As a result, most hosting services seek to differentiate themselves from the commodity-hosting business by offering extensive site design, marketing, optimization, and other services.

There are a number of considerations involved in outsourcing hosting. You need to make sure the vendor chosen has the capability to grow with you. You need to know what kinds of security provisions are in place for backup of your site, internal monitoring of activity, and security track record. Many Fortune 500 firms have their own private cloud data centers so that they can control their sites' environment. On the other hand, there are risks to hosting your own site. Costs will be higher compared to outsourcing because you don't have the market power to obtain low-cost hardware and telecommunications. You will have to purchase hardware and software, have a physical facility, lease communications lines, hire a staff, and build security and backup capabilities yourself.

Testing the System

unit testing
involves testing the site's program modules one at a time

system testing
involves testing the site as a whole, in a way the typical user will use the site

Once the system has been built and programmed, you will have to engage in a testing process. Depending on the size of the system, this could be fairly difficult and lengthy. Testing is required whether the system is outsourced or built in-house. A complex e-commerce site can have thousands of pathways through the site, each of which must be documented and then tested. It is important to note that testing is generally underbudgeted. As much as 50% of the budget can be consumed by testing and rebuilding (usually depending on the quality of the initial design). **Unit testing** involves testing the site's program modules one at a time. **System testing** involves testing the site as a whole, in the same way a typical user would when using the site. Because there is no

truly "typical" user, system testing requires that as many conceivable paths as possible be tested. Final **acceptance testing** requires that the firm's key personnel and managers in marketing, production, sales, and general management actually use the system as installed on a test server. This acceptance test verifies that the business objectives of the system as originally conceived are in fact working.

acceptance testing verifies that the business objectives of the system as originally conceived are in fact working

Another form of testing is called **A/B testing** (or **split testing**). This form of testing involves showing two versions (A and B) of a web page or website to different users to see which version performs better. There are several different types of A/B testing that can be used for a website design project. A *template test* compares the same general page content using two different layouts and/or design treatments. A *new concept test* compares a control page with one that is very different. A *funnel test* compares the flow through a series of pages (such as a product page, to a registration page, to a shopping cart page, versus skipping the registration page) to see which one results in a higher percentage of conversions. **Multivariate testing** is a much more sophisticated form of testing than A/B testing. Multivariate testing involves identifying specific elements, or variables, on a web page, such as a headline, image, button, and text, creating versions for each element, and then creating a unique combination of each element and version to test. So, for example, if there are three elements and two versions of each, there will be eight possible combinations ($2 \cdot 2 \cdot 2 = 8$) to test. When used correctly, multivariate testing enables designers to identify the most optimal layout, color, content, and format.

A/B testing (split testing) involves showing two versions of a web page or website to different users to see which version performs better

multivariate testing involves identifying specific elements, creating versions for each element, and then creating a unique combination of each element and version to test

Implementation, Maintenance, and Optimization

Most people unfamiliar with systems erroneously think that once an information system is installed, the process is over. In fact, while the beginning of the process is over, the operational life of a system is just beginning. Systems break down for a variety of reasons—most of them unpredictable. Therefore, they need continual checking, testing, and repairing. Systems maintenance is vital, but sometimes is not budgeted for. In general, the annual system maintenance cost will roughly parallel the development cost. An e-commerce site that cost $40,000 to develop is likely to require a $40,000 annual expenditure to maintain. Very large e-commerce sites experience some economies of scale so that, for example, a site that cost $1 million to develop is likely to require an annual maintenance budget of perhaps half to three-quarters of that cost.

Why does it cost so much to maintain an e-commerce site? Unlike payroll systems, for example, e-commerce sites are always in a process of change, improvement, and correction. Studies of traditional systems maintenance have found 20% of the time is devoted to debugging code and responding to emergency situations. Another 20% of the time is concerned with changes in reports, data files, and links to backend databases. The remaining 60% of maintenance time is devoted to general administration (making product and price changes in the catalog) and making changes and enhancements to the system. E-commerce sites are never finished: They are always in the process of being built and rebuilt. They are dynamic—much more so than payroll systems.

The long-term success of an e-commerce site for a medium-sized to large business typically depends on a dedicated team of employees (the web team) whose sole job is to monitor and adapt the site to changing market conditions. The web team must be multi-skilled; it will typically include programmers, designers, and business managers drawn from marketing, production, and sales support. One of the first tasks of the

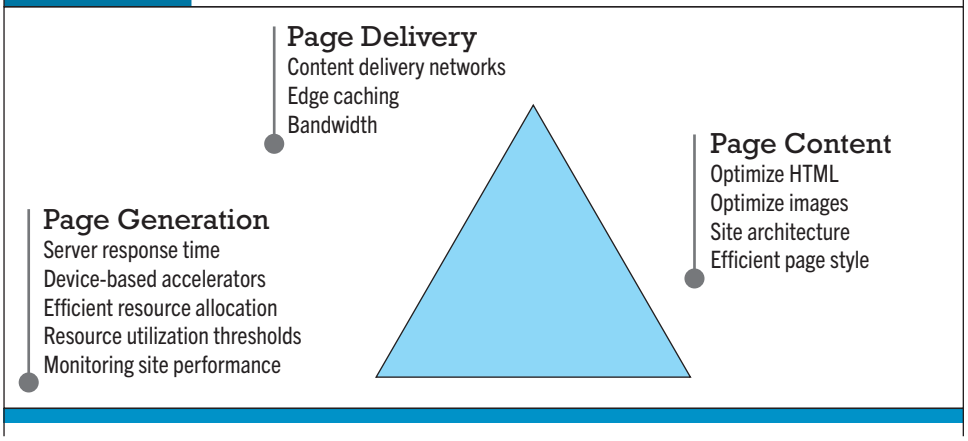
benchmarking
a process in which the site is compared with those of competitors in terms of response speed, quality of layout, and design

web team is to listen to customers' feedback on the site and respond to that feedback as necessary. A second task is to develop a systematic monitoring and testing plan to be followed weekly to ensure all the links are operating, prices are correct, and pages are updated. Other important tasks of the web team include **benchmarking** (a process in which the site is compared with those of competitors in terms of response speed, quality of layout, and design) and keeping the site current on pricing and promotions. The Web is a competitive environment where you can very rapidly frustrate and lose customers with a dysfunctional site.

Factors in Optimizing Website Performance If you are a small firm using one of the available design and hosting sites like WordPress, you do not have to worry about hardware, software, and website optimizing techniques because the vendor will provide this expertise. However, it is still important to have an understanding of the issues involved. The purpose of a website is to deliver content to customers and to complete transactions. The more quickly and more reliably these two objectives are met, the more effective the website is from a commerce perspective. If you are a manager or marketing executive, you will want the website operating in a way that fulfills customers' expectations. You'll have to make sure the website is optimized to achieve this business objective. The optimization of website performance involves a number of factors, including page content, page generation, and page delivery (see **Figure 4.9**). Later in this chapter, we describe the software and hardware choices involved in building an e-commerce site; these are also important factors in website optimization.

Using efficient styles and techniques for *page content* can reduce response times by two to five seconds. Simple steps include reducing unnecessary HTML comments and white space, using more efficient graphics, and avoiding unnecessary links to other pages in the site. *Page generation* speed can be enhanced by segregating computer servers to perform dedicated functions (such as static page generation, application logic, media servers, and database servers), and using various devices from vendors to speed up these servers. Using a single server or multiple servers to perform multiple tasks reduces throughput by more than 50%. *Page delivery* can be sped up by

FIGURE 4.9 FACTORS IN WEBSITE OPTIMIZATION



Website optimization requires that you consider three factors: page content, page generation, and page delivery.

using specialized content delivery networks such as Akamai or by increasing local bandwidth. We will discuss some of these factors throughout the chapter, but a full discussion of optimizing website performance is beyond the scope of this text.

ALTERNATIVE WEB DEVELOPMENT METHODOLOGIES

Today, in addition to the traditional systems development life cycle process, there are a number of alternative development methodologies intended to expedite the process. Although a detailed examination of these methodologies is beyond the scope of this text, it is helpful to be familiar with some of the basic terms and concepts.

Prototyping consists of building a sample or model rapidly and inexpensively to test a concept or process. The initial prototype can be iteratively refined based on feedback until it satisfies user requirements. Prototyping is particularly useful for user interface design (often referred to as *front-end design*). There are various ways to prototype, ranging from simple paper sketches, to *wireframing* (creating a "skeleton" version that focuses on functionality rather than design), to using software tools to create clickable mockups, to building an actual prototype in, for example, HTML, CSS, and JavaScript.

prototyping
consists of building a sample or model rapidly and inexpensively to test a concept or process

Agile development breaks down a large project into a series of smaller subprojects that are completed in short periods of time using iteration and continuous feedback. Improvement or addition of new functionality takes place within the next iteration as developers clarify requirements. This helps to minimize the overall risk and allows the project to adapt to changes more quickly. Agile methods emphasize face-to-face communication over written documents, encouraging people to collaborate and make decisions quickly and effectively. **Scrum** is a type of agile development that provides a framework for managing the development process. The Scrum process typically involves a cross-functional team headed by a "coach" and uses the concept of a "sprint," during which the team takes a small set of features of the project from idea to code to tested functionality and integrates them into the end product.

agile development
breaks down a large project into a series of smaller subprojects that are completed in short periods of time using iteration and continuous feedback

Scrum
type of agile development that provides a framework for managing the development process

DevOps also builds on agile development principles as an organizational strategy to create a culture and environment that further promote rapid and agile development practices. DevOps stands for "development and operations" and emphasizes close collaboration between the developers who create applications and the operational staff who run and maintain the applications. DevOps aims to promote better and more frequent communication and collaboration between systems development and operations groups and a fast and stable workflow throughout the entire development life cycle. With this type of organizational change along with agile techniques, standardized processes, and more powerful automated software creation and testing tools, it is possible to release more reliable applications more rapidly and more frequently.

DevOps
builds on agile development principles as an organizational strategy to create a culture and environment that further promote rapid and agile development practices

Component-based development takes advantage of the functionality offered by object-oriented programming tools. **Component-based development** enables a system to be built by assembling and integrating various software components that already have been assembled and that provide common functions such as a user interface or online ordering capability. Businesses are using component-based development to create their e-commerce applications by combining commercially available components

component-based development
enables a system to be built by assembling and integrating various software components that already have been assembled and that provide common functions

for shopping carts, user authentication, search engines, and catalogs with pieces of software for their own unique business requirements.

web services
loosely coupled, reusable software components using XML and other open protocols and standards that enable one application to communicate with another via an application programming interface (API) without requiring any custom programming to share data and services

Web services are loosely coupled, reusable software components that use Extensible Markup Language (XML) and other open protocols and standards to enable one application to communicate with another via an application programming interface (API) without requiring any custom programming to share data and services. In addition to supporting internal and external integration of systems, web services can be used as tools for building new information system applications or enhancing existing systems. Because these software services use a universal set of standards, they can be less expensive and less difficult to weave together than proprietary components. Web services can perform certain functions on their own and can also engage other web services to complete more complex transactions, such as checking credit, procuring products, or ordering products. By creating software components that can communicate and share data regardless of the operating system, programming language, or client device, web services can provide significant cost savings in systems building while opening up new opportunities for collaboration with other companies.

service-oriented architecture (SOA)
a style of software design that employs a set of self-contained services that communicate with each other to create a working software application

microservices
very granular implementation of SOA in which an application is decomposed into a number of smaller services, each responsible for a discrete task, that can communicate with other services to solve a larger, complex business problem

Web services are the preferred method of implementing a **service-oriented architecture (SOA)**, a style of software design that employs a set of self-contained services that communicate with each other to create a working software application. SOA allows for the reuse of existing assets, enabling the creation of new services from an existing IT infrastructure of systems, as well as interoperability, which permits different web services to run on a variety of software platforms and hardware architectures. **Microservices** are a very granular implementation of SOA in which an application is decomposed into a number of smaller services, each responsible for a discrete task that can communicate with other services to solve a larger, complex business problem. A key advantage of a microservices focus is that they can be built and deployed independently, making it easier to isolate errors specific to the service as well as scale them independently of the applications that use them.

4.3 CHOOSING SOFTWARE

Along with telecommunications, software and hardware constitute the infrastructure of an e-commerce presence. Although today many businesses choose to outsource their e-commerce infrastructure to cloud providers, it is still very important to have a basic understanding of the underlying software and hardware components that comprise that presence.

SIMPLE VERSUS MULTI-TIERED WEBSITE ARCHITECTURE

system architecture
the arrangement of software, machinery, and tasks in an information system needed to achieve a specific functionality

Prior to the development of e-commerce, websites simply delivered web pages to users who were making requests through their browsers for HTML pages with content of various sorts. Website software was appropriately quite simple—it consisted of a server computer running basic web server software. We might call this arrangement a single-tier system architecture. **System architecture** refers to the arrangement of software, machinery, and tasks in an information system needed to achieve a specific

functionality (much like a home's architecture refers to the arrangement of building materials to achieve a particular functionality). Many websites started this way—there are no monetary transactions. Tens of thousands of sites still perform this way.

However, the development of e-commerce required a great deal more interactive functionality, such as the ability to respond to user input (name and address forms), take customer orders for goods and services, clear credit card transactions on the fly, consult price and product databases, and even adjust advertising on the screen based on user characteristics. This kind of extended functionality required the development of web application servers and a multi-tiered system architecture to handle the processing loads. *Web application servers*, described more fully later in this section, are specialized software programs that perform a wide variety of transaction processing required by e-commerce.

In addition to having specialized application servers, e-commerce sites must be able to pull information from and add information to corporate databases. These databases are called *backend* (or, if they predate the e-commerce era, *legacy*) databases. Corporations have made massive investments in these systems to store their information on customers, products, employees, and vendors. These backend systems constitute an additional layer in a multi-tiered site.

Figure 4.10 illustrates a simple two-tier and a more complex multi-tier e-commerce site architecture. In **two-tier architecture**, a web server responds to requests for web pages, and a database server provides backend data storage. In a **multi-tier architecture**, in contrast, the web server is linked to a middle-tier layer that typically includes a series of application servers that perform specific tasks, as well as to a backend layer of existing corporate systems containing product, customer, and pricing information. A multi-tiered site typically employs several physical computers, each running some of the software applications and sharing the workload across many physical computers.

two-tier architecture e-commerce system architecture in which a web server responds to requests for web pages and a database server provides backend data storage

multi-tier architecture e-commerce system architecture in which the web server is linked to a middle-tier layer that typically includes a series of application servers that perform specific tasks as well as a backend layer of existing corporate systems

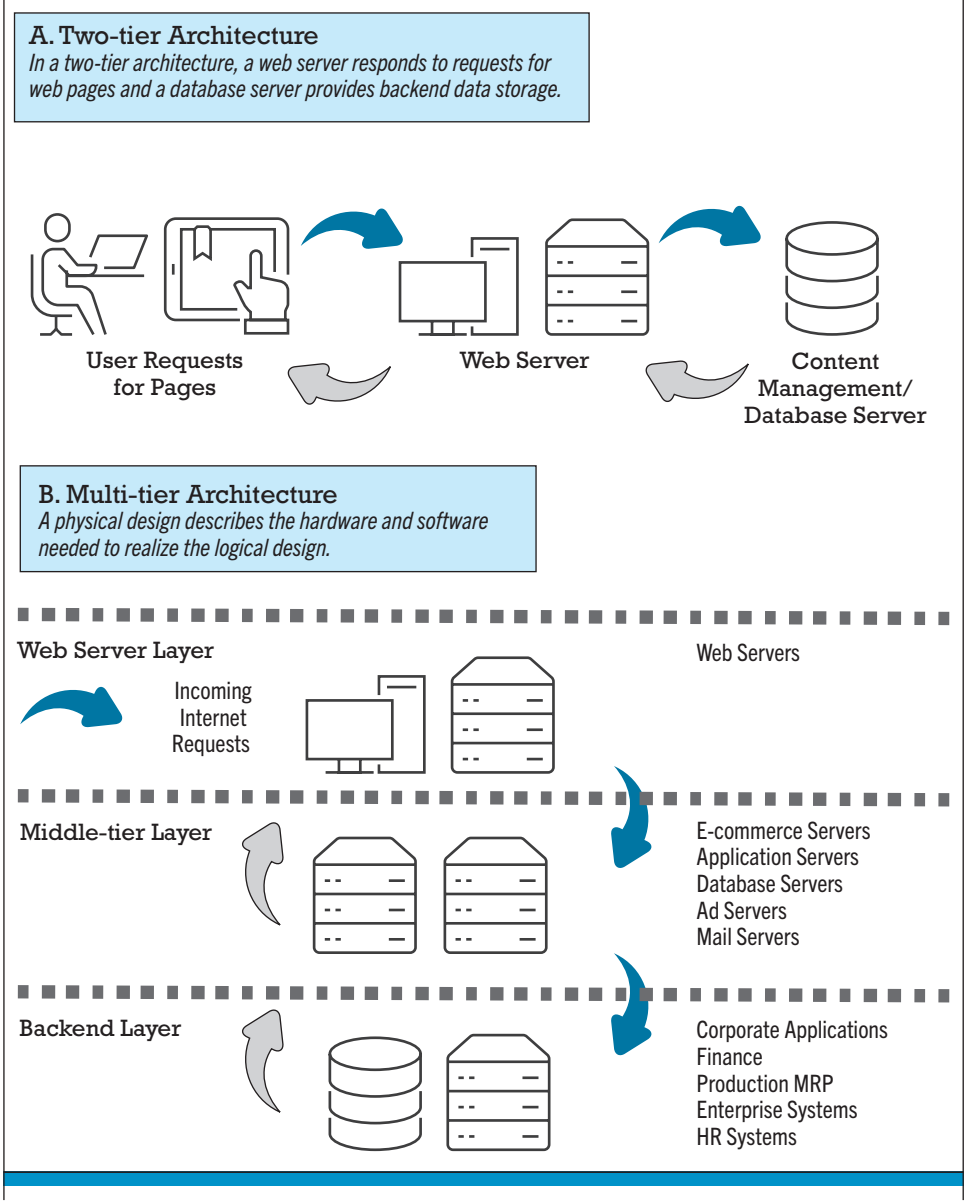
The remainder of this section describes basic web server software functionality and the various types of web application servers.

WEB SERVER SOFTWARE

All e-commerce sites require basic web server software to answer requests from customers for HTML and XML pages. In addition, basic web server functionality includes security services, file transfer, search services, data capture, e-mail, and site management tools (see Table 3.11 in Chapter 3). Apache, which works with Linux and Unix operating systems, is the leading web server software in terms of domains, active sites, and usage by the top 1 million busiest sites (Netcraft, 2022). Unix is the original programming language of the Internet and Web, and Linux is a derivative of Unix designed for the personal computer. Apache, which was developed by a worldwide community of Internet innovators, is free and can be downloaded from many sites on the Web. Literally thousands of programmers have worked on Apache over the years; thus, it is extremely stable. There are thousands of utility software programs written for Apache that can provide all the functionality required for a contemporary e-commerce site.

Microsoft Internet Information Services (IIS) is another popular type of web server software. IIS is based on the Windows operating system and is compatible with a wide selection of Microsoft utility and support programs.

FIGURE 4.10 TWO-TIER AND MULTI-TIER E-COMMERCE SITE ARCHITECTURES



There are also many other smaller providers or open-source versions of web server software. Note that the choice of web server has little effect on users. The pages they see will look the same regardless of the development environment. There are many advantages to the Microsoft suite of development tools—they are integrated, powerful, and easy to use. The Linux operating system, on the other hand, is exceptionally reliable and stable, and there is a worldwide open software community that develops and tests Linux-based web server software.

Site Management Tools

Site management tools are an important functionality of web server software. **Site management tools** verify that links on pages are still valid and also identify orphan files, or files on the site that are not linked to any pages. By surveying the links on a website, a site management tool can quickly report on potential problems and errors that users may encounter. Links to URLs that have moved or been deleted are called dead links; these can cause error messages for users trying to access that link. Regularly checking that all links on a site are operational helps prevent irritation and frustration in users who may decide to take their business to a better-functioning site.

site management tools
verify that links on pages are still valid and also identify orphan files

Even more importantly, site management tools can help you understand consumer behavior on your website. More sophisticated site management software and services, such as those provided by Webtrends, can be purchased in order to more effectively monitor customer purchases and marketing campaign effectiveness, as well as keep track of standard hit counts and page visit information. These services can track your e-commerce presence on the Web, mobile, and social network platforms.

Dynamic Page Generation Tools

One of the most important innovations in website operation has been the development of dynamic page generation tools. Prior to the development of e-commerce, websites primarily delivered unchanging, static content in the form of HTML pages. While this capability might be sufficient to display pictures of products, consider all the elements of a typical e-commerce site today by reviewing Table 4.2, or visit what you believe is an excellent e-commerce site. The content of successful e-commerce sites is always changing, often day by day. These sites feature new products and promotions, changing prices, news events, and stories of successful users. E-commerce sites must intensively interact with users who not only request pages but also request product, price, availability, and inventory information. One of the most dynamic sites is eBay—the auction site. There, the content is changing minute by minute. E-commerce sites are just like real markets—they are dynamic. News sites, where stories change constantly, also are dynamic.

The dynamic and complex nature of e-commerce sites requires a number of specialized software applications in addition to static HTML pages. **Dynamic HTML (DHTML)** is a term used to refer to a collection of technologies, including HTML, CSS, JavaScript, and the Document Object Model (DOM) (an application programing interface), that can be used together to create interactive websites. DHTML can be used to change the way a page looks but does not actually generate a unique page. Dynamic web page generation is more complex. With **dynamic page generation**, the contents of a web page are stored as objects in a database, rather than being hard-coded in HTML. When the user requests a web page, the contents for that page are then fetched from the database. The objects are retrieved from the database using Java Server Pages (JSP), Node.js, ASP.NET, or other server-side programs. JSP, Node.js, and ASP.NET are described in Section 4.5. This technique is much more efficient than working directly in HTML code. It is much easier to change the contents of a database than it is to change the coding of an HTML page. A standard data access method called *Open Database Connectivity (ODBC)* makes it possible for applications written in the C programming language to access data—via an ODBC driver that serves as a translator between the application and the database—from

Dynamic HTML (DHTML)
term used to refer to a collection of technologies that can be used together to create interactive websites

dynamic page generation
the contents of a web page are stored as objects in a database, rather than being hard-coded in HTML. When the user requests a web page, the contents for that page are then fetched from the database

any database regardless of the database and operating system software being used. ODBC drivers are available for most of the major database management systems offered by companies such as Microsoft, Oracle, SAP, and Sybase. Java Database Connectivity (JDBC) is a version of ODBC that provides connectivity among applications written in the Java programming language and a wide range of databases. However, while ODBC remains the de facto standard for cross-platform data access, today many web development platforms provide functionality that allows a programmer to directly link to a target database, making ODBC/JDBC drivers unnecessary.

Dynamic page generation gives e-commerce several significant capabilities compared to traditional commerce. Dynamic page generation lowers *menu costs* (the costs incurred by merchants for changing product descriptions and prices). Dynamic page generation also permits easy online *market segmentation*—the ability to sell the same product to different markets. For instance, you might want variations on the same display ad depending on how many times the customer has seen the ad. In the first exposure to a car ad, you might want to emphasize brand identification and unique features. On the second exposure you might want to emphasize superlatives like "most family friendly" to encourage comparison to other brands. The same capability makes possible nearly cost-free *price discrimination*—the ability to sell the same product to different customers at different prices. For instance, you might want to sell the same product to corporations and government agencies but use different marketing themes. Based on a cookie you place on client computers, or in response to a question on your site that asks visitors if they are from a government agency or a corporation, you would be able to use different marketing and promotional materials for corporate clients and government clients. You might want to reward loyal customers with lower prices and charge full price to first-time buyers. Dynamic page generation allows you to approach different customers with different messages and prices.

web content management system (WCMS)
used to create and manage web content

Dynamic page generation also enables the use of a web content management system (WCMS). A **web content management system (WCMS)** is used to create and manage web content. It separates the design and presentation of content (such as HTML documents, images, video, and audio) from the content creation process. The content is maintained in a database and dynamically linked to the website. A WCMS usually includes templates that can be automatically applied to new and existing content; WYSIWYG editing tools that make it easy to edit and describe (tag) content; and collaboration, workflow, and document management tools. There are a wide range of commercial WCMSs available that are designed to cater to different-sized businesses, including products offered by OpenText, Adobe, Sitecore, and HubSpot, as well as a number of open-source options, such as WordPress, Joomla, Drupal, OpenCms, and others.

APPLICATION SERVERS

web application server
software program that provides the specific business functionality required of a website

Web application servers are software programs that provide the specific business functionality required of a website, such as catalog display, transaction processing (shopping cart), database, streaming media, advertising, and e-mail. The basic idea of application servers is to isolate the business applications from the details of displaying web pages to users on the front end and the details of connecting to databases on the backend. Application servers are a kind of middleware software that provides the glue connecting traditional corporate systems to the customer as well as all the

functionality needed to conduct e-commerce. In the early years, a number of software firms developed specific, separate programs for each function, but increasingly, these specific programs are being replaced by integrated software tools that combine all the needed functionality for an e-commerce site into a single development environment, a packaged software approach.

There is a wide variety of application server software available in the marketplace. For Linux environments, many of these capabilities are available free on the Internet from various sites. Most businesses—faced with this bewildering array of choices—choose to use integrated software tools called e-commerce merchant server software.

E-COMMERCE MERCHANT SERVER SOFTWARE (E-COMMERCE SOFTWARE PLATFORMS)

Rather than build your site from a collection of disparate software applications, it is easier, faster, and generally more cost-effective to purchase e-commerce merchant server software. **E-commerce merchant server software** (also called an **e-commerce software platform**) offers an integrated environment that promises to provide most or all of the functionality and capabilities you will need to develop a sophisticated, customer-centric site. Important elements of e-commerce merchant software packages are an online catalog and a built-in shopping cart that can manage orders and clear credit card transactions.

e-commerce merchant server software (e-commerce software platform)
offers an integrated environment that provides most or all of the functionality and capabilities needed to develop a sophisticated, customer-centric site

A company that wants to sell products online must have a list, or **online catalog**, of its products available on its website. E-commerce merchant server software typically includes a database capability that will allow for construction of a customized online catalog. The complexity and sophistication of the catalog will vary depending on the size of the company and its product lines.

online catalog
list of products available on a website

Online **shopping carts** are much like their real-world equivalents: Both allow shoppers to set aside desired purchases in preparation for checkout. The difference is that the online variety is part of an e-commerce merchant server software program residing on a web server and allows consumers to select merchandise, review what they have selected, edit their selections as necessary, and then actually make the purchase by clicking a button. The software automatically stores shopping cart data.

shopping cart
allows shoppers to set aside desired purchases in preparation for checkout, review what they have selected, edit their selections as necessary, and then actually make the purchase by clicking a button

A site's shopping cart typically works in conjunction with credit card processing software, which verifies the shopper's credit card and then puts through the debit to the card and the credit to the company's account at checkout. E-commerce merchant software typically supplies the software for this function. Otherwise, you would have to make arrangements with a variety of credit card–processing banks and intermediaries.

While existing firms often have the financial capital to invest in commercial e-commerce merchant server software, many small firms and startups do not. Such firms can use the e-commerce merchant services provided by companies that make it easy to create an e-commerce website with customizable templates. Most templates today contain ready-to-go site designs with built-in e-commerce functionality like shopping carts, payment clearance, and site management tools. For example, for $29 per month, Shopify offers a basic plan that includes an online store, including an e-commerce website, blog, and built-in m-commerce shopping cart, as well as the ability to sell on online marketplaces and social networks. Shopify Payments, which comes with the account, enables the merchant to accept all major credit cards for a

TABLE 4.4 OPEN-SOURCE SOFTWARE OPTIONS

FUNCTIONALITY	OPEN-SOURCE SOFTWARE
Web server	Apache (the leading web server for small and medium-sized businesses)
Shopping cart, online catalog	Many providers: osCommerce, Zen Cart, AgoraCart, X-cart, AspDotNetStorefront
Credit card processing	Credit card acceptance is typically provided in shopping cart software, but you may need a merchant account from a bank as well.
Database	MySQL (the leading open-source SQL database for businesses)
Programming/scripting language	PHP is a scripting language embedded in HTML documents but executed by the server, providing server-side execution with the simplicity of HTML editing. JavaScript programs are typically client-side programs that provide user interface components. Ruby on Rails (RoR, Rails) and Django are popular open-source web application frameworks. Python and Perl are two other open-source programming languages used in web development.
Analytics	Analytics keep track of your site's customer activities and the success of your web advertising campaign. You can also use Google Analytics if you advertise on Google, which provides good tracking tools; most hosting services will provide these services as well. Other open-source analytic tools include Matomo and Open Web Analytics.

small transaction fee. The basic plan also includes a variety of shopping cart, store management, search engine optimization, and marketing tools. Many others, such as WordPress (WooCommerce), Wix, Square, Weebly, Squarespace, BigCommerce, and Vendio, offer similar services.

open-source software software that is developed by a community of programmers and designers and is free to use and modify

Some firms and startups opt instead for open-source merchant server software. **Open-source software** is software developed by a community of programmers and designers and is free to use and modify. **Table 4.4** provides a description of some open-source options. The advantage of using open-source tools is that you can get exactly what you want: a truly customized, unique website. The disadvantage is that it may take several months to develop the site and get all the tools to work together seamlessly.

Midrange e-commerce software platforms include HCL Commerce (formerly IBM WebSphere Commerce) and Sitecore Experience Commerce. High-end enterprise solutions for large global firms are provided by SAP Commerce, Oracle ATG Web Commerce, Adobe Commerce, and others. Many of these e-commerce software platforms, such as HCL Commerce, SAP Commerce Cloud, Salesforce Commerce Cloud, Oracle Commerce Cloud, and NetSuite SuiteCommerce (also owned by Oracle), among others, are now available on a software as a service (SaaS) basis, a model in which the software is hosted in the cloud and run by the client via a web browser. This model enables a firm to launch an e-commerce site very quickly. There are several hundred software firms that provide e-commerce software, which raises the costs of making sensible decisions on this matter.

Choosing an E-commerce Software Platform

With all of these vendors, how do you choose the right one? Evaluating these tools and making a choice is one of the most important and uncertain decisions you will make

in building an e-commerce site. The real costs are hidden—they involve training your staff to use the tools and integrating the tools into your business processes and organizational culture. The following are some of the key factors to consider:

- Functionality, including availability on an SaaS basis
- Support for different business models, including m-commerce
- Business process modeling tools
- Visual site management tools and reporting
- Performance and scalability
- Connectivity to existing business systems
- Compliance with standards
- Global and multicultural capability
- Local sales tax and shipping rules

For instance, although e-commerce software platforms promise to do everything, your business may require special functionality—such as streaming audio and video. You will need a list of business functionality requirements. Your business may involve several different business models—such as a retail side and a business-to-business side; you may run auctions for stock excess as well as fixed-price selling. Be sure the package can support all of your business models. You may wish to change your business processes, such as order taking and order fulfillment. Does the platform contain tools for modeling business processes and workflows? Understanding how your site works will require visual reporting tools that make its operation transparent to many different people in your business. A poorly designed software package will drop off significantly in performance as visitors and transactions expand into the thousands per hour, or minute. Check for performance and scalability by stress-testing a pilot edition or obtaining data from the vendor about performance under load. You will have to connect the e-commerce platform to your traditional business systems. How will this connection to existing systems be made, and is your staff skilled in making the connection? Because of the changing technical environment—in particular, changes in m-commerce platforms—it is important to document exactly what standards the platform supports now and what the migration path will be toward the future. Finally, your e-commerce site may have to work both globally and locally. You may need a foreign language edition using foreign currency denominations. And you will have to collect sales taxes across many local, regional, and national tax systems. Does the e-commerce platform support this level of globalization and localization?

4.4 CHOOSING HARDWARE

Whether you host your own site or outsource the hosting and operation of your site, you will need to understand certain aspects of the computing hardware platform. The **hardware platform** refers to all the underlying computing equipment that the system uses to achieve its e-commerce functionality. The objective is to have enough platform capacity to meet peak demand (avoiding an overload condition), but not so much

hardware platform refers to all the underlying computing equipment that the system uses to achieve its e-commerce functionality

platform that you are wasting money. Failing to meet peak demand can mean your site is slow or even crashes. How much computing and telecommunications capacity is enough to meet peak demand? How many hits per day can your site sustain?

To answer these questions, you will need to understand the various factors that affect the speed, capacity, and scalability of an e-commerce site.

RIGHT-SIZING YOUR HARDWARE PLATFORM: THE DEMAND SIDE

The most important factor affecting the speed of a site is the demand that customers put on the site. **Table 4.5** lists the most important factors to consider when estimating the demand on a site.

Demand on a website is fairly complex and depends primarily on the type of site you are operating. The number of simultaneous users in peak periods, the nature of customer requests, the type of content, the required security, the number of items in

TABLE 4.5 FACTORS IN RIGHT-SIZING AN E-COMMERCE PLATFORM

SITE TYPE	PUBLISH/ SUBSCRIBE	SHOPPING	CUSTOMER SELF-SERVICE	TRADING	WEB SERVICES/ B2B
Examples	WSJ.com	Amazon	Travelocity	E*Trade	Ariba e-procurement exchanges
Content	Dynamic Multiple authors High volume Not user-specific	Catalog Dynamic items User profiles with data mining	Data in legacy applications Multiple data sources	Time sensitive High volatility Multiple suppliers and consumers Complex transactions	Data in legacy applications Multiple data sources Complex transactions
Security	Low	Privacy Nonrepudiation Integrity Authentication Regulations	Privacy Nonrepudiation Integrity Authentication Regulations	Privacy Nonrepudiation Integrity Authentication Regulations	Privacy Nonrepudiation Integrity Authentication Regulations
Percent secure pages	Low	Medium	Medium	High	Medium
Cross-session information	No	High	High	High	High
Searches	Dynamic Low volume	Dynamic High volume	Nondynamic Low volume	Nondynamic Low volume	Nondynamic Moderate volume
Unique items (SKUs)	High	Medium to high	Medium	High	Medium to high
Transaction volume	Moderate	Moderate to high	Moderate	High to extremely high	Moderate
Legacy integration complexity	Low	Medium	High	High	High
Page views (hits)	High to very high	Moderate to high	Moderate to low	Moderate to high	Moderate

inventory, the number of page requests, and the speed of legacy applications that may be needed to supply data to the web pages are all important factors in overall demand on a website system.

Certainly, one important factor to consider is the number of simultaneous users who will likely visit your site. In general, the load created by an individual customer on a server is typically quite limited and short-lived. A web session initiated by the typical user is **stateless**, meaning that the server does not have to maintain an ongoing, dedicated interaction with the client. A web session typically begins with a page request, then a server replies, and finally the session is ended. The sessions may last from tenths of a second to a minute per user. Nevertheless, system performance does degrade as more and more simultaneous users request service. Fortunately, degradation (measured as "transactions per second" and "latency," or delay in response) is fairly graceful over a wide range, up until a peak load is reached and service quality becomes unacceptable (see **Figure 4.11**).

stateless
refers to the fact that the server does not have to maintain an ongoing, dedicated interaction with the client

Serving up static web pages is **I/O intensive**, which means it requires input/output (I/O) operations rather than heavy-duty processing power. As a result, website performance is constrained primarily by the server's I/O limitations and the telecommunications connection, rather than the speed of the processor.

I/O intensive
requires input/output operations rather than heavy-duty processing power

Other factors to consider when estimating the demand on a website are the user profile and the nature of the content. If users request searches, registration forms, and order taking via shopping carts, then demands on processors will increase markedly.

RIGHT-SIZING YOUR HARDWARE PLATFORM: THE SUPPLY SIDE

Once you estimate the likely demand on your site, you will need to consider how to scale up your site to meet demand. We have already discussed one solution that requires very little thought: Outsource the hosting of your website to a cloud-based service. You can also engage the services of a content delivery network (CDN) such as Akamai. See Chapter 3 for a discussion of cloud-based computing services and a case study on Akamai. However, if you decide to host your own website, scalability is an important consideration. **Scalability** refers to the ability of a site to increase in size as demand warrants. There are three steps you can take to meet the demands for service at your site: scale hardware vertically, scale hardware horizontally, and/or improve the processing architecture of the site (see **Table 4.6** on page 211). **Vertical scaling** refers to increasing the processing power of individual components. **Horizontal scaling** refers to employing multiple computers to share the workload and increase the "footprint" of the installation (Dang, 2021).

scalability
the ability of a site to increase in size as demand warrants

vertical scaling
increasing the processing power of individual components

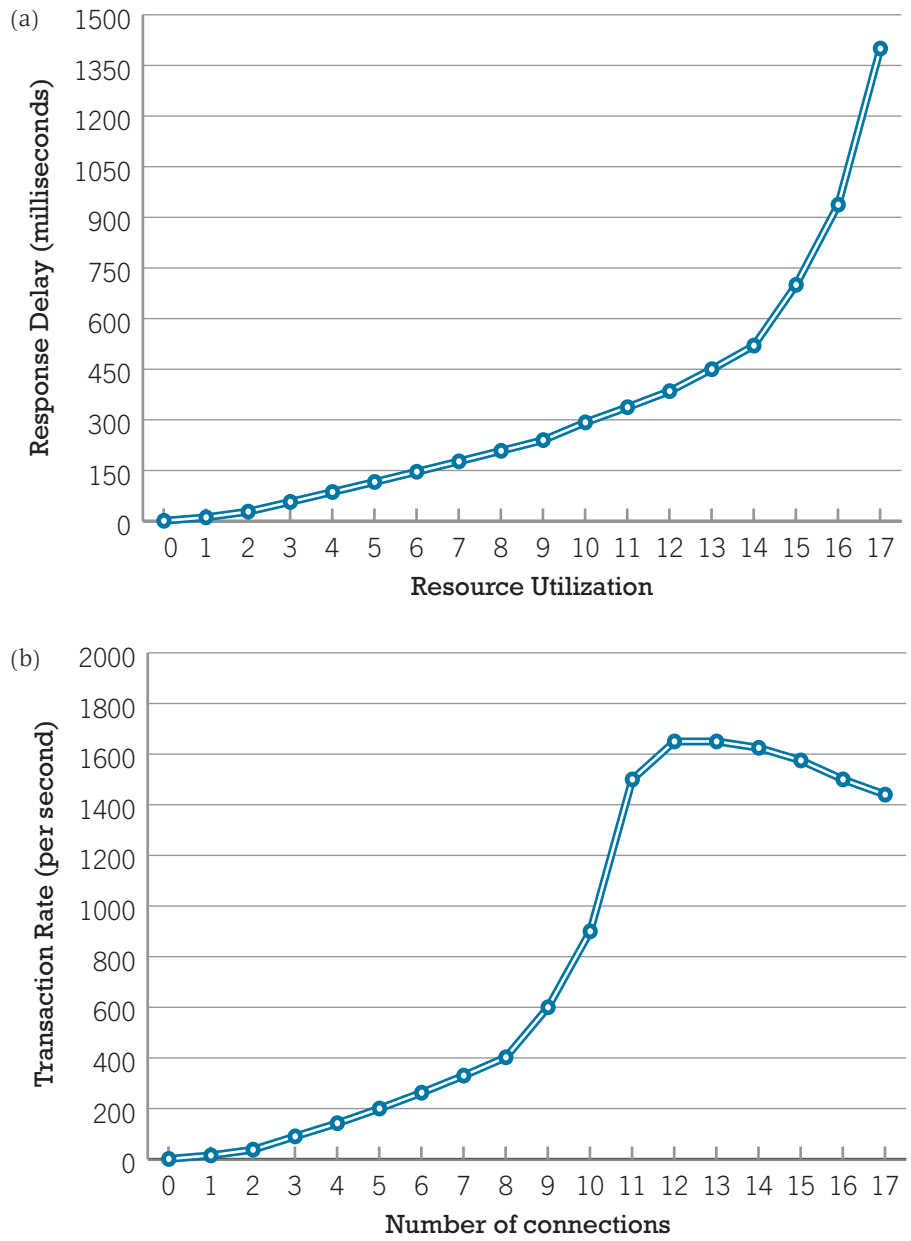
horizontal scaling
employing multiple computers to share the workload

You can scale your site vertically by upgrading the servers from a single processor to multiple processors. You can keep adding processors to a computer, depending on the operating system, and upgrade to faster chip speeds as well.

There are two drawbacks to vertical scaling. First, it can become expensive to purchase additional processors with every growth cycle, and second, your entire site becomes dependent on a small number of very powerful computers. If you have two such computers and one goes down, half of your site, or perhaps your entire site, may become unavailable.

Horizontal scaling involves adding multiple servers to your site and balancing the load among the servers. You can then partition the load so that some servers handle

FIGURE 4.11 DEGRADATION IN PERFORMANCE AS NUMBER OF USERS INCREASES



Degradation in web server performance occurs as the number of users (connections) increases and as the system's resources (processors, storage) become more utilized. In (a), user-experienced delay rises gracefully until an inflection point is reached, and then delay rises exponentially to an unacceptable level. In (b), the transaction rate rises gracefully until the number of users rapidly escalates the transaction rate, and at a certain inflection point, the transaction rate starts declining as the system slows down or crashes.

TABLE 4.6 VERTICAL AND HORIZONTAL SCALING TECHNIQUES

TECHNIQUE	APPLICATION
Use a faster computer.	Deploy edge servers, data servers, etc.
Create a cluster of computers.	Use computers in parallel to balance loads.
Use appliance servers.	Use special-purpose computers optimized for their task.
Segment workload.	Segment incoming work to specialized computers.
Batch requests.	Combine related requests for data into groups; process as group.
Manage connections.	Reduce connections between processes and computers to a minimum.
Aggregate user data.	Aggregate user data from legacy applications in single data pools.
Cache.	Store frequently used data in cache rather than on the disk.

only requests for static HTML pages, while others are dedicated to handling database applications. You will need special load-balancing software (provided by a variety of vendors such as Cisco, Microsoft, and IBM) to direct incoming requests to various servers.

There are many advantages to horizontal scaling. It is inexpensive and often can be accomplished using older computers that otherwise might be disposed of. Horizontal scaling also introduces redundancy—if one computer fails, chances are that another computer can pick up the load dynamically. However, when your site grows from a single computer to perhaps 10 to 20 computers, the size of the physical facility required (the "footprint") increases, and there is added management complexity.

A third alternative—improving the processing architecture—is a combination of vertical and horizontal scaling, combined with artful design decisions. **Table 4.7** lists some of the more common steps you can take to improve performance of your

TABLE 4.7 IMPROVING THE PROCESSING ARCHITECTURE OF YOUR SITE

ARCHITECTURE IMPROVEMENT	DESCRIPTION
Separate static content from dynamic content.	Use specialized servers for each type of workload.
Cache static content.	Increase RAM and store static content in RAM.
Cache database lookup tables.	Use cache tables to look up database records.
Consolidate business logic on dedicated servers.	Put shopping cart, credit card processing, and other CPU-intensive activity on dedicated servers.
Optimize code.	Examine your code to ensure it is operating efficiently.
Optimize the database schema.	Examine your database search times, and take steps to reduce access times.

site. Most of these steps involve splitting the workload into I/O-intensive activities (such as serving web pages) and CPU-intensive activities (such as taking orders). Once you have this work separated, you can fine-tune the servers for each type of load. One of the least expensive fine-tuning steps is to simply add RAM to a few servers and store all your HTML pages in RAM. This reduces load and increases speed dramatically. RAM is fast and inexpensive. The next most important step is to move your CPU-intensive activities, such as order taking, onto a high-end, multiple-processor server that is dedicated to handling orders and accessing the necessary databases.

4.5 OTHER E-COMMERCE SITE TOOLS

Now that you understand the key factors affecting the speed, capacity, and scalability of your website, we can consider some other important requirements. You will need a coherent website design that makes business sense—not necessarily a site to wow visitors or excite them, but to sell them something. You will also need to know how to build active content and interactivity into your site—not just display static HTML pages. You must be able to track customers who come, leave, and return to your site in order to be able to greet return visitors ("Hi, Sarah, welcome back!"). You will also want to track customers throughout your site so that you can personalize and customize their experience. You will definitely want the ability for customers to generate content and feedback on your site to increase their engagement with your brand. Finally, you will need to establish a set of information policies for your site—privacy, accessibility, and access to information policies.

In order to achieve these business capabilities, you will need to be aware of some design guidelines and additional software tools that can cost-effectively achieve the required business functionality.

WEBSITE DESIGN: BASIC BUSINESS CONSIDERATIONS

This is not a text about how to design websites. (In Chapter 6, we discuss website design issues from a marketing perspective.) Nevertheless, from a business manager's perspective, there are certain design objectives you must communicate to your website designers to let them know how you will evaluate their work. At a minimum, your customers will need to be able to find what they need at your site, make a purchase, and leave. A website that annoys customers runs the risk of losing the customers forever. See **Table 4.8** for a list of the most common consumer complaints about websites.

Some critics believe poor design is more common than good design. It appears easier to describe what irritates people about websites than to describe how to design a good website. The worst e-commerce sites make it difficult to find information about their products and make it complicated to purchase goods; they have missing pages and broken links, a confusing navigation structure, and annoying graphics or sounds that you cannot turn off. **Table 4.9** restates these negative experiences as positive goals for website design.

TABLE 4.8 E-COMMERCE WEBSITE FEATURES THAT ANNOY CUSTOMERS

- Requiring user to view ad or intro page before going to website content
- Pop-up and pop-under ads and windows
- Too many clicks to get to the content
- Links that don't work
- Confusing navigation; no search function
- Requirement to register and log in before viewing content or ordering
- Pages that load slowly
- Content that is out of date
- Inability to use browser's Back button
- No contact information available (web form only)
- Unnecessary splash screens, animation, etc.
- Music or other audio that plays automatically
- Unprofessional design elements
- Text not easily legible due to size, color, format
- Typographical errors
- No or unclear returns policy

TOOLS FOR SEARCH ENGINE OPTIMIZATION

A website is only as valuable from a business perspective as the number of people who visit it. The first stop for most customers looking for a product or service is to start with a search engine, follow the listings on the page (usually starting with the top three to five listings), and then glance to the sponsored ads to the right. The higher you are on the search engine pages, the more traffic you will receive. Appearing on Page 1 is much better than appearing on Page 2. So how do you get to Page 1 in the organic (unpaid) search listings? While every search engine is different, and none of them publishes their algorithms for ranking pages, there are some basic ideas that work well:

- *Metatags, keywords, titles, page contents:* Search engines "crawl" your site and identify keywords as well as title pages and then index them for use in searches. Pepper your pages with keywords that accurately describe what you say you do in your metatag

TABLE 4.9 THE EIGHT MOST IMPORTANT FACTORS IN SUCCESSFUL E-COMMERCE SITE DESIGN

FACTOR	DESCRIPTION
Functionality	Pages that work, load quickly, and point the customer toward your product offerings
Informational	Links that customers can easily find to discover more about you and your products
Ease of use	Simple, foolproof navigation
Redundant navigation	Alternative navigation to the same content
Ease of purchase	One or two clicks to purchase
Multi-browser functionality	Site works with the most popular browsers
Simple graphics	Avoids distracting, obnoxious graphics and sounds that the user cannot control
Legible text	Avoids backgrounds that distort text or make it illegible

site "description" and "keywords" sections of your source code. The goal is to find a balance of the different types of keywords, including shorter head keywords that may be more generic (such as "car"), body keywords that may be slightly more specific (such as "British sports car"), and long-tail keywords that are much more detailed (such as "1968 red Jaguar XKE convertible").

- *Offer expertise:* White papers, industry analyses, FAQ pages, guides, and histories are excellent ways to build confidence on the part of users and to encourage them to see your website as the place to go for help and guidance.
- *Get linked up:* Encourage other sites to link to your site; create a blog that attracts people and who will share your URL with others and post links in the process. Create a Facebook page for your company, and think about using Instagram or Pinterest to develop a following or fan base for your products.
- *Buy ads:* Complement your organic search optimization efforts with paid search engine keywords and ads. Choose your keywords, and purchase direct exposure on web pages. You can set your budget and put a ceiling on it to control costs. See what works, and observe the number of visits to your site produced by each keyword string.
- *Local e-commerce:* Developing a national market can take a long time. If your website is particularly attractive to local people, or if it involves products sold locally, use keywords that connote your location so that people can find you nearby. Town, city, and region names in your keywords—such as "Hudson Valley honey" or "San Francisco blues music"—can be helpful.

TOOLS FOR INTERACTIVITY AND ACTIVE CONTENT

The more interactive a website is, the more effective it will be in generating sales and encouraging return visitors. Although functionality and ease of use are the supreme objectives in site design, you will also want to interact with users and present them with a lively, "active" experience. You will want to personalize the experience for customers by addressing their individual needs and customize the content of your offerings based on their behavior or expressed desires. In order to achieve these business objectives, you will need to consider carefully the tools necessary to build these capabilities. Simple interactions such as a customer submitting a name, along with more complex interactions involving credit cards, user preferences, and user responses to prompts, all require special programs. The following sections provide a brief description of some commonly used software tools for achieving high levels of site interactivity.

Common Gateway Interface (CGI) the first widely accepted set of standards for communication between a browser and a program running on a server that allowed for interaction between the user and the server

In the early days of the Web, Common Gateway Interface (CGI) programs (scripts) were the primary method of creating interactivity. **Common Gateway Interface (CGI)** was the first widely accepted set of standards for communication between a browser and a program running on a server that allowed for interaction between the user and the server. CGI enabled an executable program to access all the information within incoming requests from clients. The program could then generate all the output required to make up the return page (the HTML, script code, text, etc.) and send it back to the client via the web server. All the computing took place on the server side (this is why CGI programs and others like them are referred to as "server-side" programs). Today, however,

CGI scripts have become obsolete, due to security and other concerns, and have been replaced by more modern and secure methods.

Java, Java Server Pages (JSP), and JavaScript

Java is a programming language that allows programmers to create interactivity and active content on the client computer, thereby saving considerable load on the server. Java was initially developed by Sun Microsystems as a platform-independent programming language for consumer electronics. The idea was to create a language whose programs (so-called Write Once Run Anywhere [WORA] programs) could operate on any computer regardless of operating system. This would be possible if every operating system at the time (Macintosh, Windows, Unix, DOS, and mainframe MVS systems) had a Java Virtual Machine (VM) installed that would interpret the Java programs for that environment.

Java
a programming language that allows programmers to create interactivity and active content on the client computer, thereby saving considerable load on the server

By 1995, however, when Sun Microsystems released Java 1.0, the first public version of the language, it had become clear that Java was more applicable to the Web than to consumer electronics. Java "applets" could be downloaded to the client over the Web and executed entirely on the client's computer. Applet tags could be included in an HTML page. To enable this, each browser had to include a Java VM. When the browser accessed a page with an applet, a request would be sent to the server to download and execute the program and allocate page space to display the results of the program. Today, Java remains one of the most popular programming languages, with many critical technologies, such as the Google Android mobile platform (although not Apple's iOS), leveraging aspects of the language. Java SE (Java Platform, Standard Edition) 18 and its related development environment JDK (Java Development Kit) 18 are the most current versions of the Java platform as of February 2022. However, Java does face some challenges. In recent years, it has been plagued by security flaws that Oracle (which acquired Sun Microsystems) has been attempting to address with the frequent release of new versions and security patches. Due to security concerns, Oracle has phased out Java applets, and the current versions of most browsers no longer support them. Developers of Java-based web apps now bundle Java within the app so that applets are not necessary (Oracle, 2022).

Java Server Pages (JSP) is a web page-coding standard that allows developers to use a combination of HTML, JSP scripts, and Java to dynamically generate web pages in response to user requests. JSP uses Java "servlets," small Java programs that are specified in the web page and run on the web server to modify the web page before it is sent to the user who requested it. JSP is supported by most of the popular application servers on the market today.

Java Server Pages (JSP)
web page-coding standard that allows developers to dynamically generate web pages in response to user requests

JavaScript is a programming language invented by Netscape that is used to control objects on an HTML page and handle interactions with the browser. It is most commonly used on the client side to handle verification and validation of user input, as well as to implement business logic. For instance, JavaScript can be used on customer registration forms to confirm that a valid phone number, zip code, or e-mail address has been given. Before a user finishes completing a form, the e-mail address given can be tested for validity. JavaScript appears to be much more acceptable to corporations and other environments in large part because it is more stable and is also restricted to the operation of requested HTML pages. JavaScript is also used as part of Node.js, a cross-platform

JavaScript
a programming language invented by Netscape that is used to control objects on an HTML page and to handle interactions with the browser

environment for server-side applications (including mobile). Node.js is one of the most popular server-side developer frameworks, used by companies such as PayPal, Walmart, and LinkedIn, resulting in JavaScript remaining a vital language not just for web development but also for platform as a service (PaaS) applications.

There are also a number of other tools based on JavaScript that help automate the process of creating web applications. React and Vue are open-source JavaScript libraries for building user interfaces. AngularJS (sometimes also referred to as Angular.js) is another popular tool. AngularJS is a JavaScript-based open-source front end web application framework that extends the functionality of HTML. D3.js (short for Data Driven Documents) is a JavaScript library for visualizing data with HTML, SVG, and CSS. jQuery is a cross-platform JavaScript library designed to simplify the client-side scripting of HTML. Ajax (asynchronous JavaScript and XML) uses a variety of different tools, including JavaScript, to allow web pages to be updated asynchronously (i.e., updating only parts of the page rather than having to reload the entire page to change just part of the content). TypeScript is an open-source programming language developed and maintained by Microsoft that is designed for the development of large applications. It is included in Microsoft's Visual Studio software development package. Typescript is a superset of JavaScript, building on JavaScript but with extra development tools. Existing JavaScript programs are also valid TypeScript programs. TypeScript can be used to develop both client-side and server-side JavaScript applications. The use of TypeScript has soared over the past several years (Krill, 2022).

Active Server Pages (ASP) and ASP.NET

Active Server Pages (ASP)
a proprietary software development tool that enables programmers using Microsoft's IIS to build dynamic pages

ASP.NET
the successor to ASP

Active Server Pages (ASP) was invented by Microsoft in late 1996 and grew rapidly to become the major technique for server-side web programming in the Windows environment. ASP enables developers to easily create and open records from a database and execute programs within an HTML page as well as handle all the various forms of interactivity found on e-commerce sites. ASP permits an interaction to take place between the browser and the server. However, ASP programs are restricted to use on Windows servers running Microsoft's IIS web server software. **ASP.NET**, first released in January 2002 and part of Microsoft's .NET framework, is the successor to ASP. The current version of ASP.NET features a modern, cross-platform web framework for cloud and regular application servers.

ColdFusion

ColdFusion
an integrated server-side environment for developing interactive web applications

ColdFusion is an integrated server-side environment for developing interactive web and mobile applications. Originally developed by Macromedia and now offered by Adobe, ColdFusion combines an intuitive, tag-based scripting language and a tag-based server scripting language (CFML) that lowers the cost of creating interactive features. ColdFusion offers a powerful set of visual design, programming, debugging, and deployment tools, including the ability to create mobile apps, robust security features, and support for interoperability. The most recent version, Adobe ColdFusion 2021/2020, offers a new administrative user interface, improved object-oriented programming support, express and modular installation features, and enhanced cloud and security tools (Atteo, 2022).

PHP, Ruby on Rails (RoR), and Django

PHP is an open-source, general-purpose scripting language that is most frequently used in server-side web applications to generate dynamic web page content, although it can also be used for client-side graphical user interface applications. PHP is also a part of many web application development frameworks, such as CakePHP, CodeIgniter, and others, and is also part of the LAMP (Linux, Apache, MySQL, PHP) open-source web development model for building dynamic websites and web applications (Perl and Python are sometimes substituted for PHP in some LAMP projects). According to W3Techs, PHP is, by far and away, the most commonly used server-side scripting language (used by more than 75% of the websites whose server-side programming language it was able to identify), with ASP.NET a distant second, used by around 8%; followed by Ruby on Rails at 6%; Java, with only about 4%; Scala (a general-purpose programming language that has the capability to interoperate with Java and JavaScript) at around 2.5%; JavaScript at about 2%; and Python at a little more than 1%. ColdFusion and Perl were both used by fewer than 1% (W3techs.com, 2022). Hackers often try to exploit PHP code and use it for a variety of attacks, such as SQL injection, code injection, and phishing attacks.

PHP
an open-source, general-purpose scripting language

Ruby on Rails (Ruby, RoR, or Rails) is an open-source web application framework based on the Ruby programming language. RoR is based on a philosophy known as convention over configuration, or coding by convention (CoC), which means that the framework provides a structured layout that minimizes the number of decisions that the programmer needs to make, thereby simplifying and speeding development. JavaScript and Ajax are highly integrated into RoR, which makes it easy to handle Ajax requests for page updates. Ruby was very popular in the early 2000s, but in the last several years, it has fallen out of favor somewhat. Some well-known websites based on RoR include Shopify, Groupon, Etsy, Kickstarter, Hulu, and Airbnb (Rejman, 2022).

Ruby on Rails (Ruby, RoR, or Rails)
an open-source web application framework based on the Ruby programming language

Django is also an open-source web application framework. It is based on the Python programming language. Django is optimized for the creation of complex, database-driven websites. It allows for fast development, focuses on automating as much as possible, emphasizes the reusability of various components, and follows the DRY (Don't Repeat Yourself) programming principle. Some well-known websites based on Django include Instagram, Spotify, Pinterest, Dropbox, NASA, and Quora (Citrusbug.com, 2021).

Django
an open-source web application framework based on the Python programming language

Other Design Elements

One easy way to pump up the energy on your website is to include some appropriate widgets (sometimes called gadgets, plug-ins, or snippets). **Widgets** are small chunks of code that execute automatically in your HTML web page. They are prebuilt, and many are free. Social networks and blogs use widgets to present users with content drawn from around the Web (news headlines from specific news sources, announcements, press releases, and other routine content), calendars, clocks, weather, games, and other functionality. You can copy the code to an HTML web page. You can find widgets at Apple's Dashboard Widgets, Wolfram|Alpha Widgets, and SIMILE Widgets. There are also widgets for specific platforms such as WordPress, Amazon, and Pinterest.

widget
a small, prebuilt chunk of code that executes automatically in your HTML web page; capable of performing a wide variety of tasks

Mashups are a little more complicated and involve pulling functionality and data from one program and including it in another. The most common mashup involves using Google Maps data and software and combining it with other data. For instance, if

you have a local real estate website, you can download Google Maps and satellite image applications to your site so that visitors can get a sense of the neighborhood. There are thousands of Google Map mashups, from maps of political protests to maps of the Fortune 500 companies, all with associated news stories and other content. Other mashups involve sports, shopping, and news.

PERSONALIZATION/CUSTOMIZATION TOOLS

You will definitely want to know how to treat each customer on an individual basis and emulate a traditional, face-to-face marketplace. *Personalization* (the ability to treat people based on their personal qualities and prior history with your site) and *customization* (the ability to change the product to better fit the needs of the customer) are two key elements of e-commerce that potentially can make it nearly as powerful as a traditional marketplace and perhaps even more powerful than shopping at an anonymous suburban shopping mall. Speaking directly to the customer on a one-to-one basis, and even adjusting the product to the customer, is quite difficult in the usual type of mass marketing, one-size-fits-all commercial transactions that characterize much of contemporary commerce.

Website personalization involves altering a website based on who is viewing it, by serving dynamic content, messages, and offers tailored to the individual. E-commerce customization focuses on generating personalized product recommendations, including both similar and complementary items.

There are a number of methods for achieving personalization and customization. One basic method involves the placement of cookie files on the user's client computer. A cookie is a small text file placed on the user's client computer that can contain any kind of information about the customer, such as customer ID, campaign ID, or prior purchases at the site. When the user returns to the site, or indeed goes further into the site, the customer's prior history can be accessed from a database. Information gathered on prior visits can then be used to personalize the visit and customize the product. We discuss the use of cookies and other behavioral tracking tools further in Chapter 6.

There are also a number of other, more sophisticated tools available that offer intelligent customer segmentation, personalization, and individualized product recommendations. Examples include Kibo Montetate and Barilliance. Most e-commerce suites, such as Salesforce Commerce Cloud, include similar functionality. At the other end of the spectrum, Google Optimize is a free tool that can customize a website based on visitor location, browser device, and digital behavior.

privacy policy
a set of public statements declaring to your customers how you treat their personal information that you gather on the site

accessibility rules
a set of design objectives ensuring that users with disabilities can effectively access your site

THE INFORMATION POLICY SET

When developing an e-commerce site, you will also need to focus on the set of information policies that will govern the site. You will need to develop a **privacy policy**—a set of public statements declaring to your customers how you treat their personal information that you gather on the site. You also will need to establish **accessibility rules**—a set of design objectives ensuring that users with disabilities can effectively access your site. There are more than 50 million Americans with disabilities, many of whom may require special help in order to be able to access computers or mobile devices (see *Insight on Society: Designing for Accessibility*). E-commerce information policies are described in greater depth in Chapter 8.

INSIGHT ON SOCIETY

DESIGNING FOR ACCESSIBILITY

Online accessibility is a significant issue for the more than 25% of the U.S. population that self-identifies as having a disability. Efforts to remedy this problem have taken several forms.

Some courts have interpreted the Americans with Disabilities Act (ADA), originally enacted in 1990, as applying to websites and virtual spaces, just as much as to physical spaces. However, other early rulings suggested the opposite view: that the ADA does not apply to online-only companies without an actual physical location. Courts around the United States have continued to split on this issue in recent years. For instance, in 2021, a federal court in California ruled that Domino's had violated the ADA because its website and mobile app were not fully accessible to users with visual impairments. The court stated that the ADA applies to all websites and apps that facilitate access to the goods and services of a physical public accommodation. Shortly thereafter, a different federal court reached the opposite conclusion with respect to Winn Dixie's website, finding that the ADA does not apply, and dismissed a claim against the supermarket chain based on its inability to be accessed via screen reading software.

In March 2022, the U.S. Department of Justice (DOJ) finally issued its own guidelines on web accessibility and the ADA. The DOJ stated its position that the ADA applies to all goods, services, privileges, or activities offered by public accommodations, including those offered on the Web. This guidance strongly suggests that the DOJ believes that the ADA requires all private websites, even those of web-only businesses, to be accessible to persons with disabilities. However, given the split opinions among the various federal courts, there remains a number of unanswered questions. As a result, it is likely that at some point, the Supreme Court will be asked to address the issue. The DOJ's guidance does not set out any detailed standards for how to make web content accessible for people with disabilities, and instead refers to the World Wide Web Consortium (W3C) Web Content Accessibility Guidelines (WCAG) and also what are known as Section 508 standards, which the federal government uses for its own websites.

WCAG provides organizations with strategies for accommodating people with different kinds of disabilities. Such strategies include providing text alternatives for any non-text content so that it can be changed to other formats; making content easier to see and hear; and maximizing compatibility with assistive technologies, such as screen reader software. For instance, embedding text descriptions behind images allows screen readers to announce those descriptions. Screen readers work effectively but only if websites are designed to ensure compatibility with these tools. The most current version of WCAG is WCAG 2.0, but W3C is now working on WCAG 3.0. The new version of WCAG is more extensive than the previous version and aims to accommodate more disabilities, cover a wider array of technologies, and be easier to update. For example, WCAG 3.0 will pay more attention to the needs of people with varying levels of impairment. It will be applicable to a variety of new technologies, such as wearable devices, voice assistants, Internet of Things technologies, augmented reality, virtual reality, and the metaverse. Although the final version is not expected to be published before 2023, companies can begin to prepare for it based on the draft version currently available.

The federal government's Section 508 standards closely reference WCAG 2.0, further legitimizing the WCAG guidelines as the

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regulatory standard. Specific components include de-emphasizing purely decorative elements of a website with text for screen readers, which can detract from ease of use; better directions for making online forms accessible to people with disabilities; and more specific standards for creating content without screen flickering, which may trigger seizures.

Other acceptable solutions identified by the Federal Communications Commission (FCC) include working with the Accessibility APIs developed for the operating systems of various devices, such as Microsoft Active Accessibility or Apple's Accessibility APIs. Relying on third-party solutions is also acceptable if they are readily available at a low cost. To help identify such solutions for the industry, the FCC presents annual awards for advances in accessibility. In 2021, Apple was honored for including a suite of accessibility features and upgrades in its iOS14 release, including a new Apple Magnifier app feature that detects nearby individuals and helps them maintain physical distance, upgrades to its native screen reader functionality, enhanced sound recognition, and functionality to enhance users' ability to use sign language over FaceTime. Apple also introduced Assistive Touch for the Apple Watch, enabling touch-free interaction.

Apple isn't the only major tech firm devoting resources to improving accessibility. Doing so is a simple way for such firms to grow their user base, reduce legal risk, and improve the site experience for a significant portion of their users. Google continues to add tools across a broad range of products and services for people with disabilities. In 2021, for instance, it launched an Android app that can generate custom voice recognition models for people with severe speech impairments, enabling the app to transcribe, display, and read aloud what the user said. It also enhanced its Talkback screen reader to include new gestures and voice commands. Microsoft's Windows 11 operating system includes higher-contrast themes that are more viewable by people with visual impairments, as well as updated sounds that can be heard by more users. Microsoft has also launched a five-year commitment to building more accessible products. Amazon has updated both its Alexa and Kindle apps to make them more accessible. Facebook is continuing to hone its "automatic alt-text" feature, which uses object recognition and facial recognition to automatically generate text for user-uploaded images that screen readers can use to help visually impaired Facebook users navigate photo albums on Facebook. Forrester Research predicts that digital accessibility will be a top priority for organizations buying technology in 2022.

Still, there's a long way to go. More than 13 years after the WC3 released WCAG 1.0, it is estimated that fewer than 2% of websites are usable by the full spectrum of people with disabilities. At the same time, the need for website and mobile app accessibility has been emphatically emphasized by the Covid-19 pandemic. As the pandemic surged, governments around the world required people to remain at home, limiting their ability to interact with society other than through online methods. In such a world, it is even more critical that websites and apps be accessible to all, including those who have a disability.

SOURCES: "DOJ Breaks Silence on ADA Web Accessibility with New Guidance," Morganlewis.com, April 1, 2022; "New DOJ Guidance on ADA Web Accessibility Leaves Unanswered Questions," by Genova Burns LLC, Jdsupra.com, March 29, 2022; "The Future of Web Accessibility: WCAG 3.0," by Ran Ronen, Forbes.com, March 11, 2022; "The Tech Industry's Accessibility Report Card for 2021," by C. Low, Engadget.com, December 31, 2021; "FCC Announces Winners of Chair's Awards for Advancement in Accessibility," Fcc.gov, December 1, 2021; "WCAG 3.0: What You Need to Know about the Future of Accessibility Standards," by Daniel Berryhill, Uxdesign.cc, November 15, 2021; "Court Finds Domino's Pizza Violated the ADA by Having an Inaccessible Website and Orders WCAG Compliance," by Seyfarth Shaw LLC, Jdsupra.com, June 28, 2021; "Eleventh Circuit Says Winn Dixie's Inaccessible Website Does Not Violate the ADA," by Seyfarth Shaw LLC, Adatitleiii.com, April 8, 2021; "Section 508 Standards: Why Newer Is Better," Essentialaccessbility.com, April 25, 2019; "DOJ Halts Plan to Create Website Accessibility Regulations," by Roy Maurer, Shrm.org, September 25, 2017; "Can a Web Site Be a Public Accommodation Under the ADA?," Timothy Springer, Webaccessibility.com, June 5, 2012.

4.6 DEVELOPING A MOBILE WEBSITE AND BUILDING MOBILE APPLICATIONS

Today, building a website is just one part of developing an e-commerce presence. Given that more than 90% of all Internet users access the Web at least part of the time from mobile devices, businesses today need to develop mobile websites and mobile web apps, native apps, or hybrid apps in order to interact with customers, suppliers, and employees. Deciding which of these extended web presence tools to use is a first step.

There are different kinds of m-commerce platform offerings to consider, each with unique advantages and costs. A **mobile website** is a version of a regular website that is scaled down in content and navigation so that users can find what they want and move quickly to a decision or purchase. You can see the difference between a regular website and a mobile site by visiting the Amazon website from your desktop computer and then from a smartphone or tablet computer. Amazon's mobile site is a cleaner, more interactive site suitable for finger navigation and efficient consumer decision making. Like traditional websites, mobile websites run on a firm's servers and are built using standard web tools such as server-side HTML, Linux, PHP, and SQL. Like all websites, the user must be connected to the Web, and performance will depend on bandwidth. Generally, mobile websites operate more slowly than traditional websites viewed on a desktop computer connected to a broadband office network. Most large firms today have mobile websites.

mobile website
a version of a regular desktop website that is scaled down in content and navigation

A **native app** is an application designed specifically to operate using a mobile device's hardware and operating system. These stand-alone programs can connect to the Internet to download and upload data and can operate on this data even when not connected to the Internet. You can download a book to an app reader, disconnect from the Internet, and read your book. Because the various types of smartphones have different hardware and operating systems, apps are not "one size fits all" and therefore need to be developed for different mobile platforms. An Apple app that runs on an iPhone cannot operate on Android phones. As you learned in Chapter 3, native apps are built using different programming languages depending on the device for which they are intended, which is then compiled into binary code, and which executes extremely quickly on mobile devices. For this reason, native apps are ideal for games, complex interactions, on-the-fly calculations, graphic manipulations, and rich media advertising.

native app
an application designed specifically to operate using a mobile device's hardware and operating system

A **mobile web app** is an application built to run on the mobile web browser built into a smartphone or tablet computer. In the case of Apple, the native browser is Safari. Generally, a mobile web app is built to mimic the qualities of a native app using HTML5, CSS, and JavaScript. Mobile web apps are specifically designed for the mobile platform in terms of screen size, finger navigation, and graphical simplicity. Mobile web apps can support complex interactions used in games and rich media; can perform real-time, on-the-fly calculations; and can be geo-sensitive using the smartphone's built-in global positioning system (GPS) function. Mobile web apps typically operate more quickly than mobile websites but not as quickly as native apps.

mobile web app
an application built to run on the mobile web browser built into a smartphone or tablet computer

Increasingly, developers are combining elements of native apps and mobile web apps into hybrid apps. A **hybrid app** has many of the features of both a native app and a mobile web app. Like a native app, it runs inside a native container on the mobile device

hybrid app
an app that has many of the features of both a native app and a mobile web app

and has access to the device's APIs, enabling it to take advantage of many of the device's features, such as a gyroscope, that are normally not accessible by a mobile web app. It can also be packaged as an app for distribution from an app store. Like a mobile web app, it is based on HTML5, CSS3, and JavaScript but uses the device's browser engine to render the HTML5 and process the JavaScript locally.

PLANNING AND BUILDING A MOBILE PRESENCE

What is the "right" mobile presence for your firm? The answer depends on identifying the business objectives and from these, deriving the information requirements for your mobile presence. The same kind of systems analysis and design reasoning described earlier in the chapter is needed for planning and building a mobile presence, although there are important differences.

The first step is to identify the business objectives you are trying to achieve. **Table 4.10** illustrates the thought process for the analysis stage of building a mobile presence. Why are you developing a mobile presence? Is it to drive sales by creating an easily browsed catalog where users can shop and purchase? To strengthen your brand by creating an engaging, interactive experience? To enable customers to interact with your customer community? How are your competitors using their mobile presence? Once you have a clear sense of business objectives, you will be able to describe the kind of system functionality that is needed and specify the information requirements for your mobile presence.

After you have identified the business objectives, system functionality, and information requirements, you can think about how to design and build the system. Now is the time to consider which to develop: a mobile website, a mobile web app, or a native app. For instance, if your objective is branding or building community, a native app might be the best choice because it enables you to deliver a rich, interactive, and immersive experience that can strengthen the user's emotional connection with the brand. Because native apps are stored locally on the device, they can be accessed even when the user is offline, enabling the user to more deeply engage. In addition, native apps can take advantage of the mobile

TABLE 4.10 SYSTEMS ANALYSIS FOR BUILDING A MOBILE PRESENCE

BUSINESS OBJECTIVE	SYSTEM FUNCTIONALITY	INFORMATION REQUIREMENTS
Driving sales	Digital catalog; product database	Product descriptions, photos, SKUs, inventory
Branding	Showing how customers use your products	Videos and rich media; product and customer demonstrations
Building customer community	Interactive experiences; games with multiple players	Games, contests, forums, social sign-up
Advertising and promotion	Coupons and flash sales for slow-selling items	Product descriptions, coupon management, and inventory management
Gathering customer feedback	Ability to retrieve and store user inputs including text, photos, and video	Customer sign-in and identification; customer database

device's unique characteristics, such as using the gyroscope to deliver a 360-degree view. If your objective, on the other hand, is to create broad awareness, provide specific information on particular products, or drive sales, then a mobile website or mobile web app makes more sense because it is relatively easy and inexpensive to simply publish information to the mobile Web and consumers are still most comfortable completing transactions on the Web (although this is changing as more and more retailers add e-commerce functionality directly into apps). Increasingly, however, the choice will not be an either/or decision. Mobile apps and mobile websites each offer distinct benefits, and in most cases, the best strategy will be to plan to deliver compelling content across all devices.

MOBILE PRESENCE: DESIGN CONSIDERATIONS

Designing a mobile presence is somewhat different from traditional desktop website design because of different hardware, software, and consumer expectations. **Table 4.11** describes some of the major differences.

Designers need to take mobile platform constraints into account when designing for the mobile platform. Mobile page load speed has been shown to be a significant factor in conversion rates. File sizes should be kept smaller and the number of files sent to the user reduced. Focus on a few, powerful graphics, and minimize the number of images sent to the user. Prioritize the loading of critical content first, and while the user is processing that content, start to load the next layer of content. Simplify choice boxes and lists so that the user can easily scroll and touch-select the options.

Mobile presence has become so important that it is fueling a growing trend to flip the traditional e-commerce development process and begin instead with development of a mobile presence rather than a desktop website (known as **mobile first design**). Mobile first design has several advantages. Instead of creating a full-featured design for a desktop website that then needs to be scaled back, mobile first design focuses on creating the best possible experience given mobile platform constraints and then adding in elements for the desktop platform, progressively enhancing the functionality of the site. Proponents of mobile first design argue that it forces designers to focus on what is most important, and this helps create a lean and efficient mobile design that functions much

mobile first design beginning the e-commerce development process with a mobile presence rather than a desktop website

TABLE 4.11 UNIQUE FEATURES THAT MUST BE TAKEN INTO ACCOUNT IN DESIGNING A MOBILE PRESENCE

FEATURE	IMPLICATIONS FOR MOBILE PLATFORM
Hardware	Mobile hardware is smaller, and there are more resource constraints in data storage and processing power.
Connectivity	The mobile platform is constrained by slower connection speeds than desktop websites have.
Displays	Mobile displays are much smaller and require simplification. Some screens are not good in sunlight.
Interface	Touch-screen technology introduces new interaction routines that are different from the traditional mouse and keyboard. The mobile platform is not a good data entry tool but can be a good navigational tool.

better than a design that begins with a traditional platform that must be stripped down to work on mobile devices. Mobile first design is not without its challenges, however. It requires a different approach that can be difficult for designers who are more comfortable with the traditional process (The Stack Group, 2021).

Other important trends in the development of mobile websites include responsive web design and adaptive web design.

responsive web design (RWD)
tools and design principles that automatically adjust the layout of a website depending on the screen resolution of the device on which it is being viewed

Responsive web design (RWD) tools and design techniques make it possible to design a website that automatically adjusts its layout and display according to the screen resolution of the device on which it is being viewed, whether a desktop, tablet, or smartphone. RWD tools include HTML5 and CSS3, and its three key design principles involve using flexible, grid-based layouts; flexible images and media; and media queries. RWD uses the same HTML code and design for each device but uses CSS (which determines the layout of the web page) to adjust the layout and display according to the screen's form factor. RWD typically works well for sites with relatively simple functionality (i.e., sites that primarily deliver content) and that users engage with in a similar manner no matter the device being used. However, using RWD can be costly, often requiring a complete redesign of the website's interface. Another problem with RWD, particularly if not coupled with mobile first design, is that the responsive website still has the size and complexity of a traditional desktop site, sometimes making it slow to load and perform on a mobile device. Another technique, known as adaptive web design, has been developed to deal with this issue.

adaptive web design (AWD)
a server-side technique that detects the attributes of the device making the request and, using predefined templates based on device screen size along with CSS and JavaScript, loads a version of the site that is optimized for the device

With **adaptive web design (AWD)** (sometimes also referred to as *adaptive delivery* or *responsive web design with server-side components* [*RESS*]), the server hosting the website detects the attributes of the device making the request and, using predefined templates based on device screen size along with CSS and JavaScript, loads a version of the site that is optimized for the device. AWD has a number of advantages, including faster load times, the ability to enhance or remove functionality on the fly, and typically a better user experience, particularly for businesses where user intent differs depending on the platform being used. For example, creating its mobile website with AWD enabled Lufthansa to focus on actions its mobile users are most likely to take, such as checking in, getting flight status information, and looking up travel itineraries, and to provide a differentiated experience from its traditional desktop site (Vinney, 2021). A variation on AWD uses a cloud-based platform to provide similar functionality.

CROSS-PLATFORM MOBILE APP DEVELOPMENT TOOLS

In addition to creating native apps from scratch using a programming language such as Objective C or Java (as described in Chapter 3), there are hundreds of low-cost or open-source app development toolkits that make creating cross-platform mobile apps relatively easy and inexpensive, without having to use a device-specific programming language.

For instance, Flutter is an open-source toolkit developed by Google that can be used to create native apps for Android and iOS devices (as well as applications for Windows, Mac, and the Web). React Native is another open-source tool that uses React and JavaScript to build native iOS, Android, Windows, and Mac apps. Appery.io is a cloud-based platform that enables you to use a drag-and-drop visual builder tool to create HTML5 apps using jQuery Mobile. Appery.io supports Android and iOS applications. Codiqa is a similar tool that is even easier to use. It also provides a drag-and-drop interface and builds an app with 100% HTML5 components, without the need to do any coding. For those who are even less

technical, Swiftic is a free mobile app builder that allows you to include a variety of functionality, including e-commerce, notifications, and a social feed. On the more technical side, Iconic is another open-source mobile development framework that enables building hybrid mobile applications using HTML, CSS, and JavaScript. Axway Appcelerator is a similar, less technical tool for creating and managing hybrid mobile apps.

MOBILE PRESENCE: PERFORMANCE AND COST CONSIDERATIONS

If you don't have an existing website, the most efficient process may be to use a mobile first design philosophy and create a mobile site first. Alternatively, you may choose to build a traditional website using RWD or AWD techniques. If you already have a website that you don't want to totally redevelop, the least expensive path is to resize it to create a smartphone-friendly mobile site. Doing so typically will not require a complete redesign effort. You will need to reduce the graphics and text, simplify the navigation, and focus on improving the customer experience so that you do not confuse people. Because your customers might still need to use a relatively slow cellular connection at times, you will need to lighten up the amount of data you send. Also, given the difficulty of customer data entry on a mobile device, you cannot expect customers to happily enter long strings of numbers or text characters. For marketing clarity, make sure the brand images used on the mobile website match those on the traditional website. The cost of developing a mobile website can range widely, from upwards of $1 million for a custom-designed site for a large global enterprise to well under $1,000 for a small business that chooses a company, such as Wix or MoFuse, that offers a template or mobile website creator.

Building a mobile web app that uses the mobile device's browser requires more effort and cost than developing a mobile website and suffers from the same limitations as any browser-based application. However, it does offer some advantages such as better graphics, more interactivity, and faster local calculations as, for instance, in mobile geo-location applications like Foursquare that require local calculations of position and then communication with the site's web server.

The most expensive path to a mobile presence is to build a native app. Native apps can require more programming expertise, although there are many new development packages that can build mobile native apps with minimal programming expertise. In addition, virtually none of the elements used in your existing website can be reused, and you will need to redesign the entire logic of the interface and carefully think out the customer experience. For instance, there is a fairly stable traditional HTML website interface with buttons, graphics, videos, and ads that has developed over the last decade. This is not true for apps. There is no set of standards or expectations even on the part of users—every app looks different from every other app. This means the user confronts large variations in app design, so your interface must be quite simple and obvious. Many of the bells and whistles found on the large desktop website screen cannot be used in mobile apps. You'll need even greater simplification and focus. These weaknesses are also native apps' greatest strength: You have the opportunity to create a really stunning, unique customer experience where users can interact with your brand. If you want an intense branding experience with your customers, in which interaction between your brand and your customers is effortless and efficient, then native apps are the best choice. The *Insight on Technology* case, *Duolingo's Mobile App Powers Language Learning*, takes a look at the development of an innovative mobile app to help people learn a new language.

INSIGHT ON TECHNOLOGY

DUOLINGO'S MOBILE APP POWERS LANGUAGE LEARNING

When Luis von Ahn was growing up in Guatemala, he was fortunate to have parents who understood the value that fluency in English would provide him later in his life. Von Ahn came to the United States for college and ultimately became a computer science professor at Carnegie Mellon University in Pittsburgh, Pennsylvania. There, he also became a successful entrepreneur who built the technology that would become the online verification technology CAPTCHA and reCAPTCHA, which he ultimately sold to Google.

Von Ahn, together with a graduate student, Swiss-born Severin Hacker, next decided to target language learning. Both von Ahn and Hacker had learned English as a second language. In addition, they were motivated by their desire to use technology to democratize education. They began to focus on creating a tool that would transform language learning into something that millions of people would enjoy doing and in 2011 started Duolingo. Von Ahn's track record allowed him to easily garner investments from established Silicon Valley venture capitalists.

But Duolingo's trademark app-based learning interface started out as little more than an afterthought. Duolingo was originally designed first and foremost as a web-based service. In 2012, Duolingo assigned two interns the task of creating a prototype for a flashcard app to accompany the Duolingo website. The interns studied other apps popular at the time and pitched the idea of creating a fully functional app rather than just a companion app. They sought inspiration from online games like Angry Birds and Clash Royale and other gamification techniques designed to increase user engagement. For instance, most games use some form of experience points and leveling up. For Duolingo users, this comes in the form of skill trees that provide a visual representation of language skills that are interconnected and get progressively more difficult and refined over time. Other techniques they decided to incorporate included the use of cartoon mascots, such as the Duo owl, "lingots" (a Duolingo currency used to buy power-ups that can help during future lessons), leaderboards that enable users to compete with other users around the world, badges to commemorate achievements such as "streaks" (days in a row that a user completes at least one lesson), and "hearts" (similar to the game concept of "lives"). Duolingo wanted to build a learning product for the new mobile generation: effective, yet also fun.

A funny thing happened when Duolingo released the initial version of its iPhone app in 2012 and its Android app in 2013: By 2014, 80% of Duolingo users were training on mobile devices, and the company's already-impressive growth rates were skyrocketing.

Originally, Duolingo planned to generate revenue by having its users translate the text of websites as part of their exercises. Websites that wanted to translate their content into many other languages would partner with Duolingo to crowdsource the work, with human intervention when necessary for particularly difficult translations. However, only Buzzfeed and CNN ever signed up for this service, and users far preferred focused lessons to the translation exercises. Duolingo switched to a freemium model in 2017. In this model, the free version of the app includes advertisements, while premium versions, which start at $6.99/month ($84/year), are advertising-free and accessible offline as well as online. It also earns revenue

from advertising within the app as well as from in-app purchases.

With 95 courses in 40 languages, the digital infrastructure required to provide the app is significant. The company relies heavily on Amazon Web Services. Duolingo uses Amazon DynamoDB to store more than 31 billion items related to its language learning curriculum, Amazon EC2 to increase app performance, and Amazon S3 to store images. Duolingo's offline mode also caches an hour's worth of lessons to allow users to do their lessons in areas without Internet service. The offline mode, which stores much of the data for the app locally, also provides enhanced app performance. The app's speech recognition is performed in real time, however, and cannot be done offline—when users are asked to practice speaking, Duolingo measures their pronunciation against native speakers' pronunciation algorithmically and offers feedback tailored to the individual user.

Duolingo is also a heavily data-driven company, performing A/B testing on every possible feature to ensure maximum user engagement. At any point in time, it may have more than 100 different A/B tests running. When new features are introduced, one group receives the current version of the app, and the other group receives an updated version. Duolingo makes changes and then tests for many potential variables, such as whether users started more lessons or purchased Duolingo's premium version more often after the change. For example, when Duolingo first released a lesson type called Stories, in which users translate short, light-hearted narratives and are asked intermittent questions about them to check comprehension, it performed numerous A/B tests and discovered a strong increase in user retention. Users who used Stories spent more time on Duolingo than did users training in languages that didn't yet offer Stories. One aspect of the development culture at Duolingo is that it publicizes every A/B test result to the entire company so that everyone understands how and why decisions are made about various features.

Duolingo also makes use of sophisticated artificial intelligence techniques to drive better learning. For instance, it uses data from more than half a billion exercises completed daily to train sophisticated machine learning algorithms that it deploys to improve learning efficacy. One example of this is its personalization algorithm, called BirdBrain, which is designed to predict the probability that a given learner will get an exercise right or wrong. Duolingo uses BirdBrain to craft lessons that cater to a learner's specific proficiency level by providing exercises of the appropriate difficulty.

In July 2021, Duolingo went public at a valuation of more than $3.7 billion. Its flagship app has been downloaded more than 500 million times, and it currently has more than 40 million monthly active users and 2.5 million paid subscribers, about 6% of its user base. It estimates that it will have revenue in the range of $332 million to $342 million in 2022, although it does not yet expect to be operating at a profit. Although Duolingo doesn't lack competitors, such as Babbel and Busuu, it is easily the top-grossing education app worldwide as of 2022 and appears poised to retain its dominance in this growing field.

SOURCES: "Duolingo, Inc. Form 10-K for the fiscal year ended December 31, 2021," Sec.gov, March 4, 2022; "Meet the 43-Year-Old 'Genius' Behind $2.79 Billion Language App Duolingo," by Nate Skid, Cnbc.com, March 3, 2022; "Duolingo: No Profits in Sight," by Stephen Tobin, Seekingalpha.com, January 27, 2022; "Duolingo Closes Up 35% in Nasdaq Debut, Valuing Company at Nearly $5 Billion," by Riley de Leon, Cnbc.com, July 28, 2021; "Duolingo Director of Engineering Karin Tsai Talks Opinionated Development," by Natasha Mascarenhas, Techcrunch.com, July 1, 2021; "How a Bot-Fighting Test Turned into Edtech's Most Iconic Brand, Duolingo," by Natasha Mascarenhas, Techcrunch.com, May 3, 2021; "The Product-Led Growth Behind Edtech's Most Downloaded App," by Natasha Mascarenhas, Techcrunch.com, May 3, 2021; "Duolingo Stories: The Journey to Android," by Ming Zhang, Blog.duolingo.com, February 21, 2020; "Improving Duolingo, One Experiment at a Time," by Lavanya Aprameya, Blog.duolingo.com, January 10, 2020; "Game of Tongues: How Duolingo Built a $700 Million Business with Its Addictive Language-Learning App," by Susan Adams, Forbes.com, August 31, 2019; "When Duolingo Was Young: The Early Years," by Steven Loeb, Vator.tv, June 22, 2018; "Duolingo Case Study–DynamoDB Case Study," Aws.amazon.com, 2016; "Real World Swift," Blog.duolingo.com, January 7, 2015; "Free Language Learning Service Duolingo Comes to Android, Expects This Will Double Its User Base to Over 6M," by Frederic Lardinois, Techcrunch.com, May 29, 2013.

4.7 CAREERS IN E-COMMERCE

The material in this chapter provides foundational information for a number of different careers. Job titles include web developer/programmer (including front end developer/front end engineer; full stack developer; and titles that focus on a particular technology such as JavaScript developer/engineer or similar), web designer (including user interface [UI] designer, user experience [UX] designer, and interaction designer), and webmaster. Many of these positions, although labeled as "web," involve working with mobile applications as well. In this section, we'll examine a job posting by a company looking for a UX designer.

THE COMPANY

The company is a restaurant chain known for its Italian dishes, such as pizza, pasta, and heroes. The company has more than 11,000 locations worldwide. Much of its growth in the past five years has resulted from global expansion. During the Covid-19 pandemic, the company developed a robust online presence that enables customers to order meals either on the company website or via its app, and it is aiming for continuous improvement of the customer experience on that website and app.

POSITION: UX DESIGNER

You will be working with the UX Group, which reports to the Chief E-commerce Officer. The UX Group creates intuitive and engaging online experiences for the company's customers throughout its digital and mobile ecosystem, including social media. You will work on developing business processes, online roadmaps, and analytic models of consumer behavior. You will be working with product managers, online developers, and analysts. Responsibilities include:

- Contributing to the development of an entrepreneurial, cross-disciplinary UX team that embraces creativity, data, and a constant focus on the customer.
- Implementing the company's UX approach and best practices throughout the firm.
- Creating and directing the creation of customer journey maps, navigation flows, prototypes, wireframes, and interactions that are customer-centric.
- Working with data analysts to continuously improve the user experience by testing, prototyping, and analyzing customer behavior and business results.
- Contributing to UX and design thought leadership by working with product, engineering, and marketing teams to develop new products and services throughout the digital ecosystem.

QUALIFICATIONS/SKILLS

- Bachelor's degree in computer science, information science, management information systems, humanities, and/or equivalent experience
- Coursework or experience in e-commerce, human-computer interaction, web design, front end mobile web development, UX design, statistics and data analysis, and/or marketing

- Knowledge of UX tools such as Axure, Balsamiq, Sketch, and/or Adobe CC
- Knowledge of current user experience and design methodologies
- Demonstrated ability to identify solutions to business problems using a design perspective
- A desire to work in a multitasking, fast-paced environment and to collaborate as a member of the UX team
- Ability to look for solutions and information in creative ways and convey complicated results and insights to people of varying backgrounds
- Intensely curious with an intrinsic love for excellent user experience
- Strong written and spoken communication skills

PREPARING FOR THE INTERVIEW

As noted in the list of qualifications/skills, a UX designer position requires a number of technical skills that you will need to have acquired via coursework or from practical experience. You should be prepared to demonstrate that you have these basic technical skills. In addition, you are likely to be asked some questions that require you to show that you have a broad-based understanding of the process of establishing an e-commerce presence via the development of websites, mobile sites, and mobile apps. To do so, review the material in Sections 4.2, 4.3, and 4.4, which will allow you to show that you understand how the overall pieces of the effort fit together. Also review Section 4.6, which specifically focuses on some basics of mobile website and mobile app development. You can use Section 4.5 to review some basic website design features that both annoy (Table 4.8) and are appreciated (Table 4.9) by users, as well to refresh your memory about various software tools for interactivity, active content, and personalization. Finally, reread the *Insight on Society* case, *Designing for Accessibility*. Showing that you understand the importance of accessible design will be one way to help you distinguish yourself!

POSSIBLE FIRST-INTERVIEW QUESTIONS

1. What is your favorite e-commerce website or mobile app, in terms of user experience, and why do you like it? What do you think are the characteristics of a really effective e-commerce experience?

Apple is frequently viewed as a paragon of user experience. Amazon also obviously comes to mind. Why is this so? "User friendliness" is not a specific-enough answer. Focus instead on specific qualities such as ease of search (finding what you want quickly), coherent roadmap or path through the content to the purchase, fast payment, and speed and responsiveness of the screens. And of course, "design" is important. Design includes the use of images, colors, fonts, and icons.

2. We're in the food service business, delivering our products to consumers no matter where or when they want to consume our food. What would your vision be for an effective experience for our customers?

You can expand on your previous answer. Your vision might be one in which consumers can go online to the company's website or apps and find exactly what they want

(everything from a seat at a table to takeout and delivery) and do so in an acceptable time frame and price, using a visually pleasing and effective e-commerce presence.

3. How can an e-commerce presence help meet our customers' needs?

You can suggest that the traditional ways of buying a pizza (showing up at the location or ordering by telephone) can lead to customer annoyance: long waits at the physical location, long order and/or delivery time, and dropped orders. Having an effective digital presence is likely to reduce order time, increase accuracy, and provide a more predictable outcome. For instance, digital customers can be given a pick-up time at the store or arrange a definite delivery time. You might suggest an Uber-like app for mobile users.

4. How can we personalize our e-commerce presence for each consumer?

You can suggest that prior purchase records could be kept to identify customer preferences. Returning customers can be asked if they want to reorder what they had ordered during their previous visit. The digital platform needs to be able to recognize returning customers and suggest menu items they are likely to want, rather than have them follow a long roadmap through the site.

5. Have you had any experience in designing a website or mobile app? What did you learn from that experience?

If you've had some experience designing a website or mobile app, talk about the design issues you dealt with and how you solved them. If you have no experience, talk about your experience with websites or mobile apps that are difficult to use, provide a poor user experience, and have poor design qualities.

6. Do you think we should use a native mobile app or a browser-based mobile app? What about a hybrid app?

You could point out that native apps are much faster and have designs specifically suited to mobile devices. However, a separate design is needed, and this adds to the cost of a digital presence. Browser-based apps are slower, but some of the design and code of the firm's websites may be able to be re-used. A hybrid app has many of the features of a native app and mobile web app and may be the best choice.

4.8 CASE STUDY

Dick's Sporting Goods:
Pivoting Pays Off

When the Covid-19 pandemic first struck the United States in March 2020, retail stores throughout the country shut their doors. Dick's Sporting Goods, a leading retailer of sporting goods and apparel, was no exception. But unlike many other retailers, Dick's was poised to pivot, in large part due to choices it had made years earlier.

Founded in 1948 by Dick Stack in Binghamton, New York, Dick's Sporting Goods has grown from a small, local business selling fishing and camping supplies into a Fortune 500 business with stores throughout the United States. Unlike some of its competitors, Dick's was quick to embrace the online channel. However, initially, Dick's relied on external vendors for its IT and e-commerce needs. An external vendor named GSI and then eBay (after it acquired GSI) handled most aspects of Dick's e-commerce presence for approximately 15 years.

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However, by 2015, Dick's had grown to a size where its agreement with eBay was costing the company a significant amount. Many bigger businesses were starting to move their e-commerce operations away from external vendors and back within the control of the company to avoid these types of expenses. Such businesses believed this change would allow them to differentiate their e-commerce presences more easily from competitors' and adjust their software and services to best suit their capabilities. It would also allow them to maintain easier access to their proprietary customer data. Dick's rapidly increasing online sales gave it both the incentive and the budget to undertake the transition, and in 2015, it made the decision to formulate a plan to take over its own e-commerce operations, committing at the same time to a company-wide digital transformation. As part of that transformation, Dick's began the process of moving much of its software development in-house, partnering with VMware's Pivotal Labs, which works with organizations to accelerate the delivery of software and modernize legacy apps

To carry out its strategy, Dick's began development of a proprietary e-commerce platform and worked on integrating it with its existing systems. Dick's selected IBM WebSphere Commerce Suite (now HCL Commerce) for its e-commerce technology stack because of its emphasis on omnichannel shopping and fulfillment capability. The platform was designed to run on Microsoft Azure. Core components of the stack also included Apache ServiceMix service-oriented architecture; Manhattan Associates Order Management System for supply chain management; JDA Software Group software for merchandising, allocation, and replenishment; Oracle PeopleSoft for human resource management; IBM hardware; and Cisco networking technology. A data warehouse allowed Dick's to access real-time information from any area of its business.

Dick's began by moving two of its lesser brands, Field & Stream and Golf Galaxy, onto the platform to ensure that there were no major issues with it. In 2017, the company completed the launch of the new platform and over the next two years, focused on finishing the transition to in-house software for all its e-commerce platforms. The process wasn't without risk, however. Installing a completely new e-commerce platform was no easy task. It involved integrating legacy systems and new systems without losing access to information, hiring a slew of new employees to manage the system, and preventing implementation delays, cost overruns, outages, and other delays.

Specific features of the e-commerce platform that Dick's prioritized include the ability to buy online and pick up items at a store (which later proved critical) and the ability to ship from or to a store. Shipping online orders from physical Dick's stores enables the stores to function not only as traditional retail showcases but also as miniature distribution centers. This increases efficiency and improves delivery times, turning its perceived weakness of excessive bricks-and-mortar infrastructure into a strength. Approximately 80% of Dicks' e-commerce orders are shipped within the geographical area of a physical store. Customizing its infrastructure and website capabilities to capitalize on this unusual arrangement was one of the reasons Dick's wanted to reclaim operation of its e-commerce platform.

The platform also features the ability to break down and test different pricing and marketing approaches by region, an improved search function, and better analytics capabilities. Dick's has found that multichannel customers spend three times as much as single-channel customers. That's why Dick's has focused so much on integrating omnichannel features into the platform. Bringing all of its e-commerce infrastructure

in-house also gave the company better control over development cycles and sped up its testing and implementation time frames.

Dick's has also used the mobile platform to drive brand loyalty and facilitate omnichannel shopping. It first launched a mobile app for both iOS and Android smartphones in 2012 and since then has released new versions with added functionality. For instance, the app can be integrated with popular fitness trackers like Fitbit and Apple Health to encourage its customers to live a healthy lifestyle, awarding rewards card points for consistent physical activity. The app is also linked to Dick's customer loyalty program, ScoreCard, which has more than 20 million active members who collectively account for more than 70% of Dick's total sales.

Flash forward to March 2020, when Covid-19 appeared in the United States. While some companies were caught flat-footed, the time and work Dick's had already invested in developing its e-commerce platform, responsive website, and mobile app created an easy path for new services. Dick's was able to launch curbside, contactless pickup functionality on its mobile app in less than 48 hours. It embraced the lean approach with a user-centered design that it had learned from its experience partnering with Pivotal Labs to create a product that, while not perfect, was functional. It then took an iterative approach, revising the app in response to customer feedback and business needs. For instance, one challenge was enabling customers to return items. While many retailers stopped taking returns, Dick's believed it was critical to ensure customer satisfaction. A two-engineer team was able to get a version of curbside return functionality added to the app within a few days, which they then continued to improve, based on feedback.

But Dick's is not resting on its laurels. It is continuing to build its omnichannel e-commerce capabilities. For instance, it realized that its lack of a single, secure login across all its digital and mobile touchpoints was making the login process more difficult for its customers. In 2021, it selected the Auth0 identity platform to help it consolidate the process. Taking a playcard from its previous efforts, Dick's chose to first launch the system with Golf Galaxy before implementing it on its main Dick's website and mobile app.

Another area for improvement was customer personalization. Although Dick's had amassed a database of 145 million customers, it had not previously directed too much effort toward customer personalization. To drive the next phase of its digital transformation in that area, in November 2021 it selected Adobe Experience Cloud, a collection of integrated online marketing and web analytics products. Using Adobe Experience Cloud will enable Dick's to create individual profiles for each customer in its database based on their e-commerce, mobile app, e-mail, and in-store activities. The data will serve as the backbone for a mass personalization effort. Adobe's real-time customer data platform will enable Dick's to gather customer insights across channels as the interaction itself is taking place. Dick's is also investing in AI-powered product recommendations to boost average order sizes.

Dick's digital transformation efforts are paying off. For its fiscal year ending January 29, 2022, Dick's reported record earnings of about $12.3 billion in net sales, up more than 28% from the previous year. E-commerce sales comprised 21% of total net sales, compared to 16% the previous year. Dick's management points to its investments in technology, its omnichannel platform, and data science, as well as significant improvements in personalization capabilities and digital marketing, as the sources of its improved results.

SOURCES: "How Dick's Moved Its Software Development In-House and Aced Omnichannel Retail," Tanzu.vmware.com, accessed April 9, 2022; "Dick's Sporting Goods, Inc. Form 10-K for the fiscal year ended January 29, 2022," Sec.gov, March 23, 2022; "Dick's Sporting Goods Reports Largest Sales Quarter," by Abbas Haleem, Digitalcommerce360.com, March 14, 2022; "Dick's Sporting Goods and Adobe Experience Cloud to Drive Mass Personalization," by Stephen Frieder, Blog.adobe.com, November 16, 2021; "Dick's Sporting Goods Is Using Its Loyalty Program to Better Target Customers," Modernretail.com, November 16, 2021; "Dick's Sporting Goods Centralizes Customer Identity," by Dan Berthiaume, Chainstoreage.com, June 30, 2021; "Building a Legacy of Customer-Centric Digital Innovation," by Blakely Thomas-Aguilar, News.vmware.com, June 28, 2021; "A Peek into Dick's Sporting Goods' Omnichannel Fulfillment Journey," by Katie Evans, Digitalcommerce360.com, June 7, 2021; "VMware Tanzu and Microsoft Azure Help Keep Dick's Sporting Goods in the Game during Covid-19 Lockdowns," Customers.microsoft.com, December 10, 2020; "Dick's Tech Chief Goes All Out on In-House Software," by Sara Castellanos, *Wall Street Journal*, March 26, 2019; "Dick's Digital Strategy Is on the Move," by C. D. Lewis, Risnews.com, October 17, 2016; "Why Dick's Sporting Goods Decided to Play Its Own Game in E-commerce," by Larry Dignan, Techrepublic.com, April 21, 2016; "Dick's Sporting Goods Aims to Control Its E-commerce Destiny," by Larry Dignan, Zdnet.com, May 21, 2015.

Case Study Questions

1. Why did Dick's Sporting Goods decide to take over its own e-commerce operations?
2. What is Dick's Sporting Goods' omnichannel strategy?
3. How did Dick's Sporting Goods' previous decisions help it when the Covid-19 pandemic struck?

4.9 REVIEW

KEY CONCEPTS

■ **Understand the questions you must ask and answer, and the steps you should take, when developing an e-commerce presence.**

- Questions you must ask and answer, and the steps you should take, when developing an e-commerce presence include:
  - What is your vision and how do you hope to accomplish it?
  - What are your business and revenue models?
  - Who and where is the target audience?
  - What are the characteristics of the marketplace?
  - Where is the content coming from?
  - Conduct a SWOT analysis.
  - Develop an e-commerce presence map.
  - Develop a timeline.
  - Develop a detailed budget.

■ **Explain the process that should be followed in building an e-commerce presence.**

- Factors you must consider when building an e-commerce site include hardware, software, telecommunications capacity, website and mobile platform design, human resources, and organizational capabilities.
- The systems development life cycle (a methodology for understanding the business objectives of a system and designing an appropriate solution) for building an e-commerce website involves five major steps:
  - Identify the specific business objectives for the site, and then develop a list of system functionalities and information requirements. Basic business and system functionalities for an e-commerce site include a digital catalog, a product database, customer tracking, a shopping cart/payment system, an on-site blog, a customer database, an ad server, a site tracking and reporting system, and an inventory management system.
  - Develop a system design specification (both logical design and physical design).
  - Build the site, either by in-house personnel or by outsourcing all or part of the responsibility to outside contractors. Advantages of building in-house include the ability to change and adapt the site quickly as the market demands and the ability to build a site that does exactly what the company needs. Disadvantages include higher costs, greater risks of failure, a more time-consuming process, and a longer staff learning curve that delays time to market. Using design templates cuts development time, but preset templates can also limit functionality. A similar decision is also necessary regarding outsourcing the hosting of the site versus keeping it in-house
  - Test the system (unit testing, system testing, acceptance testing, A/B testing, and multivariate testing).
  - Implement and maintain the site.

- Alternative web development methodologies include prototyping, agile development, DevOps, component-based development, and service-oriented architecture (SOA) implemented using web services and microservices.

■ Identify and understand the major considerations involved in choosing web server and e-commerce merchant server software.

- Early websites used single-tier system architecture and consisted of a single server computer that delivered static web pages to users making requests through their browsers. The extended functionality of more complex websites requires a multi-tiered systems architecture, which utilizes a variety of specialized web servers as well as links to pre-existing backend or legacy corporate databases.
- All e-commerce sites require basic web server software. Apache, which works with Linux and Unix operating systems, is the most commonly used.
- Web server software provides a host of services, including processing user requests for HTML and XML pages, security services, file transfer, search services, data capture, e-mail, and site management tools.
- Dynamic page generation tools allow sites to deliver dynamic content rather than static, unchanging information. Web application server programs enable a wide range of e-commerce functionality.
- E-commerce merchant server software offers an integrated environment that provides most or all of the functionality and capabilities needed to develop a sophisticated, customer-centric site. Factors to consider in choosing an e-commerce software platform include its functionality, support for different business models, visual site management tools and reporting systems, performance and scalability, connectivity to existing business systems, compliance with standards, and global and multicultural capability.

■ Understand the issues involved in choosing the most appropriate hardware for an e-commerce site.

- Speed, capacity, and scalability are three of the most important considerations in choosing the most appropriate hardware for an e-commerce site.
- To evaluate how fast the site needs to be, companies need to assess the number of simultaneous users the site expects to see, the nature of their requests, the types of information requested, and the bandwidth available to the site. The answers to these questions will provide guidance regarding the hardware necessary to meet customer demand. In some cases, additional processing power can increase capacity, thereby improving system speed.
- Scalability is also an important issue. Scaling up to meet demand can be done through vertical or horizontal scaling or by improving processing architecture.

■ Identify additional tools that can improve website performance.

- In addition to providing a speedy website, companies must strive to have a well-designed site that encourages visitors to buy. Building in interactivity improves site effectiveness, as do personalization and customization techniques.
- Commonly used software tools for achieving high levels of website interactivity and customer personalization include Java-based web apps and Java servlets, JavaScript and tools based on JavaScript, ASP.NET, ColdFusion, PHP, Ruby on Rails (RoR or Rails), and Django.

■ Understand the important considerations involved in developing a mobile website and building mobile applications.

- It is important to understand the difference between a mobile website, native apps, mobile web apps, and hybrid apps when you are developing a mobile presence.
- The first step is to identify business objectives because they help determine which type of mobile presence is best.
- Design should take into account mobile platform constraints. Recent trends include mobile first design, responsive web design, and adaptive web design.
- Developing a mobile website is likely to be the least expensive option; mobile web apps require more effort and cost; native apps are likely to be the most expensive to develop.

QUESTIONS

1. What are the main factors to consider in developing an e-commerce presence?
2. Define the systems development life cycle, and discuss the various steps involved in creating an e-commerce site.
3. Discuss the differences between a simple logical and a simple physical website design.
4. Why is system testing important? Name the types of testing and their relationship to each other.
5. Compare the costs for system development and system maintenance. Which is more expensive, and why?
6. Why is a website so costly to maintain? Discuss the main factors that impact cost.
7. What are the main differences between single-tier and multi-tier site architecture?
8. Name the basic functionalities that web server software should provide.
9. What are the main factors to consider in choosing the best hardware platform for your website?
10. What is DevOps and how does it relate to agile development?
11. Compare and contrast the various scaling methods. Explain why scalability is a key business issue for websites.
12. What are the eight most important factors impacting website design, and how do they affect a site's operation?
13. What are Java and JavaScript? What role do they play in website design?
14. Name and describe three methods used to treat customers individually. Why are they significant to e-commerce?
15. What are some of the policies e-commerce businesses must develop before launching a site, and why must they be developed?
16. What are the advantages and disadvantages of mobile first design?
17. What is the difference between a mobile web app and a native app?
18. In what ways does a hybrid mobile app combine the functionality of a mobile web app and the functionality of a native app?
19. What is PHP, and how is it used in web development?
20. How does responsive web design differ from adaptive web design?

PROJECTS

1. Go to the website of Wix, Weebly, or another provider of your choosing that allows you to create a simple e-commerce website for a free trial period. Create a website. The site should feature at least four pages, including a home page, a product page, a shopping cart, and a contact page. Extra credit will be given for additional complexity and creativity. Come to class prepared to present your concept and website.

2. Visit several e-commerce sites, not including those mentioned in this chapter, and evaluate the effectiveness of the sites according to the eight basic criteria/functionalities listed in Table 4.9. Choose one site that you feel does an excellent job on all the aspects of an effective site, and create a PowerPoint or similar presentation, including screen shots, to support your choice.

3. Imagine that you are in charge of developing a fast-growing startup's e-commerce presence. Consider your options for building the company's e-commerce presence in-house with existing staff or outsourcing the entire operation. Decide which strategy you believe is in your company's best interest, and create a brief presentation outlining your decision. Why choose that approach? And what are the estimated associated costs, compared with the alternative? (You'll need to make some educated guesses here—don't worry about being exact.)

4. Choose two e-commerce software packages, and prepare an evaluation chart that rates the packages on the key factors discussed in the section "Choosing an E-commerce Software Platform." Which package would you choose if you were developing a website of the type described in this chapter, and why?

5. Choose one of the open-source web content management systems such as WordPress, Joomla, or Drupal or another of your own choosing, and prepare an evaluation chart similar to that required by Project 4. Which system would you choose and why?

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CHAPTER 5

E-commerce Security and Payment Systems

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

5.1 Understand the scope of e-commerce crime and security problems, the key dimensions of e-commerce security, and the tension between security and other values.
5.2 Identify the key security threats in the e-commerce environment.
5.3 Describe how technology helps to secure Internet communications channels and protect networks, servers, and clients.
5.4 Appreciate the importance of policies, procedures, and laws in creating security.
5.5 Identify the major e-commerce payment systems in use today.

NEW Video Cases

See **eText Chapter 5** to watch these videos and complete activities:

5.1 Crowdstrike and Cybersecurity

5.2 Klarna and Buy Now Pay Later (BNPL)

SolarWinds:

Shining a Light on Software Supply Chain Attacks

In December 2020, cybersecurity firm FireEye made a disturbing discovery. Its "Red Team" toolkit, containing sophisticated hacking tools used to conduct penetration testing for its clients, had been stolen. As it investigated further, it discovered something even more ominous. The attackers had entered FireEye's network via a "back door" in the network and applications monitoring software platform that it was using, from a major software company named SolarWinds.

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SolarWinds develops software that helps businesses manage their networks, systems, and IT infrastructure. A U.S.-based public company, SolarWinds has more than 300,000 customers worldwide. Its Orion network and applications monitoring platform is used by 425 of the U.S. Fortune 500, the top-10 telecommunications companies, the top-5 U.S. accounting firms, all branches of the U.S. military, and many U.S. federal agencies, as well as hundreds of universities and colleges worldwide.

After being alerted by FireEye, SolarWinds discovered that in October 2019, hackers had infiltrated SolarWinds' Orion platform "build" server (the server used by the firm's developers to create updated versions of the software) via a malware implant. SolarWinds does not know precisely how the hacker gained initial entry to the server, but its investigations uncovered evidence that the hackers had, for at least nine months prior to October 2019, used compromised credentials to access its software development environment and its internal systems to conduct research and surveillance on SolarWinds' systems.

Sometime between March and June 2020, the malware implant replaced one of the source files in the Orion software with a backdoor (so named because it provides hackers a covert way into a system). As customers using the Orion platform downloaded updates to the platform running on their networks, the backdoor spread, providing the hackers with access to those customers' networks and data. Ultimately, the hackers were able to access about 100 networks, including those of the U.S. Departments of Justice, Defense, State, Homeland Security, Treasury, Energy, and Commerce; the National Nuclear Security Administration; the National Institutes of Health; NASA; and Microsoft, as well as private sector networks throughout North America, Europe, Asia, and the Middle East. The SolarWinds hackers are believed to be a group known as APT29 (also sometimes called CozyBear, UNC2452, or Nobelium) and affiliated with the hacking arm of Russia's foreign intelligence service. As such, the attack is considered to be an act of nation-state

cyberwarfare. In April 2021, the White House instituted a range of sanctions on Russian officials and assets in response to the hack. Russia has denied the allegations, saying it was not involved.

Although SolarWinds immediately issued two hot fixes to address the vulnerability, a long time had already elapsed between the time the attack began and the time it was discovered. According to FireEye, the attack was the most sophisticated of its kind to that date and was very hard to detect because the hackers had focused on detection evasion and leveraging existing trust relationships. Even though SolarWinds took immediate steps once it learned of the attack, security experts believe that some systems might continue to be vulnerable, despite being patched, because the attackers could have pivoted and maintained a presence in other areas of a company's network without the company knowing about it.

The SolarWinds hack highlights a relatively new and menacing threat: software supply chain attacks. Most people are familiar with supply chains in the context of physical goods, but few people are aware that the concept also applies to the development of software. A software supply chain involves many different parties involved in the design, development, production, distribution, acquisition, deployment, and maintenance of software products. A software supply chain attack occurs when a hacker infiltrates the software supply chain at the development and production stage and compromises the software before it is acquired and deployed by the customer. What makes the attack so insidious is that the malicious code is inserted into a trusted piece of software via trusted mechanisms, such as the update or patch process. In addition, the hack of a single software vendor can provide hackers with a springboard into the networks of hundreds or even thousands of the vendor's customers.

In addition to compromising update servers, other techniques have been used in software supply chain attacks. Some attacks begin with the corruption of tools used to create the initial software program. In one example, hackers corrupted a version of the Microsoft Visual Studio compiler, enabling malware to be hidden in video games. Hackers have also targeted open-source code, hoping that unsuspecting developers will mistakenly add the malicious blocks of code into their own projects. For example, in 2018, researchers discovered 12 malicious Django Python code libraries with slightly misspelled names that had the same code and functionality as those they were impersonating but also had additional, malicious functionality.

Another technique involves undermining the code signing process, which is used to validate the identity of the software developer and the integrity of the code. Users and security tools typically trust signed code. However, hackers have been able to steal code signing keys and certificates and break into signing systems, enabling them to create compromised code signing certificates impersonating those of a trusted vendor. According to security researchers, a hacking group based in China, variously known as APT41, Winnti Group, or Barium, has spent more than a decade refining code signing attack methods and has been involved in a number of software supply chain attacks.

Although the SolarWinds attack was not the first software supply chain attack, it may have been a turning point in raising awareness of such attacks. Governments and organizations are now focusing intently on the steps they can take to prevent future attacks.

For instance, prior to the SolarWinds attack, few organizations, if any, incorporated the possibility of such an attack into their risk assessment procedures. In May 2021, the Biden administration issued an executive order addressing numerous aspects of government cybersecurity, with a section specifically on software supply chains, and setting new security standards for any company that wants to sell software to the federal government. In August 2021, Google announced that it would invest $10 billion in security initiatives over a five-year period and singled out software supply chains as a high-priority area.

Some security experts note that organizational efforts are equally as important as technological efforts in the fight against software supply chain attacks. From a software development standpoint, the increasing use of software development frameworks that value speed and agility adds to software supply chain risks. Organizations that have been wary of putting in place security measures that slow down development may need to rethink their processes. Experts say that software developers need to start thinking more about how to protect the integrity of software code and how to minimize risks to customers. The Cybersecurity and Infrastructure Security Agency (CISA) recommends that software developers incorporate secure practices throughout all phases of the software development process; take steps to identify and disclose vulnerabilities, including having a product vulnerability response program; participate in the CVE (Common Vulnerabilities and Exposures) database; submit products for third-party assessments; and use proactive exploit-mitigation technologies.

Organizations that acquire software also must take steps to protect themselves. Prior to acquiring software, organizations should evaluate software vendors and hold them to specified standards, similar to how manufacturing companies seek to control and limit their supply chains to ensure reliability. CISA recommends some specific actions for organizations to take, including establishing a formal Cybersecurity Supply Chain Risk Management program that involves executives and managers across the organization, establishing a set of security requirements or controls for all software suppliers, and using supplier certifications to ensure that vendors adhere to best practices.

Despite the spotlight on software supply chain attacks and more focused efforts to prevent them, they are likely to continue to occur. A 2021 global survey of more than 2,200 IT executives by security firm Crowdstrike highlights the dangers ahead. Of the organizations surveyed, 45% had experienced at least one software supply chain attack in the previous year, and almost 60% of the organizations suffering such an attack for the first time did not have a response strategy in place. Almost 85% believe that software supply chain attacks will be one of the biggest cyber threats to their organizations within the next three years.

SOURCES: "Software Supply Chain Security Becomes Prime Concern in 2022," by Nathan Eddy, Insights.dice.com, January 10, 2022; "SolarWinds-Like Supply Chain Attacks Will Peak in 2022, Apiiro Security Chief Predicts," by Jeff Burt, Esecurityplanet.com, December 23, 2021; "Ensuring Cybersecurity Defenses Permeate an Organization," by Vishal Salvi, Techradar.com, December 22, 2021; "What Is a Supply Chain Attack," Crowdstrike.com, December 8, 2021; "A Year after the SolarWinds Hack, Supply Chain Threats Still Loom," by Lily Hay Newman, Ired.com, December 8, 2021; "The SolarWinds Hack Timeline: Who Knew What, and When?" by Pam Baker, Csoonline.com, June 4, 2021; "Hacker Lexicon: What Is a Supply Chain Attack," by Andy Greenberg, Wired.com, May 31, 2021; "An Investigative Update on the Cyberattack," by Sudhakar Ramakrishna, Orangematter.solarwinds.com, May 7, 2021; "US Institutes New Russia Sanctions in Response to SolarWinds Hack," by Russell Brandom, Theverge.com, April 15, 2021; "Defending against Software Supply Chain Attacks," by Cybersecurity and Infrastructure Security Agency (CISA), Cisa.gov, April 2021; "SolarWinds Attack Explained: And Why It Was So Hard to Detect," by Lucian Constantin, Csoonline.com, December 15, 2020; "A Mysterious Hacker Group Is on a Supply Chain Hijacking Spree," by Andy Greenberg, Wired.com, May 3, 2019.

As the opening case illustrates, systems that rely on the Internet are increasingly vulnerable to large-scale attacks. Increasingly, these attacks are led by organized gangs of criminals operating globally—an unintended consequence of globalization. Even more worrisome is the growing number of large-scale attacks against critical infrastructure and companies that are funded, organized, and led by various nations. Anticipating and countering these attacks has proved a difficult task for both business and government organizations.

In this chapter, we will examine e-commerce security and payment issues. First, we will identify the major security risks and describe the variety of solutions currently available to address these risks. Then we will look at the major payment methods and consider how to achieve a secure payment environment. **Table 5.1** highlights some of the major trends in online security in 2022–2023.

TABLE 5.1 WHAT'S NEW IN E-COMMERCE SECURITY 2022–2023

- A host of security issues, ranging from the security of remote employee access, to increases in all types of phishing, to the ability of e-commerce sites to securely handle the increased volume of traffic, intensify in the wake of the Covid-19 pandemic.
- Large-scale data breaches continue to expose data about individuals to hackers and other cybercriminals; hacking related to cryptocurrencies skyrockets.
- Mobile malware presents a tangible threat as smartphones and other mobile devices become more common targets of cybercriminals, especially as their use for mobile payments increases.
- Malware and ransomware attacks rise.
- Distributed Denial of Service (DDoS) attacks are now capable of slowing Internet service within entire countries.
- The war between Russia and Ukraine gives rise to a steep increase in cyberwarfare between those countries; other countries continue to engage in cyberwarfare and cyberespionage as well.
- Hackers and cybercriminals continue to focus their efforts on social networks to exploit potential victims via social engineering and hacking attacks.
- Politically motivated, targeted attacks by hacktivist groups continue, in some cases merging with financially motivated cybercriminals to target financial systems with advanced persistent threats.
- Software vulnerabilities, such as the Apache open-source software Log4j vulnerability, as well as other zero-day vulnerabilities, continue to create security threats.
- Software supply chain attacks, such as the SolarWinds attack, in which hackers target development environments to infect software that is then downloaded by end users, increase in frequency.

5.1 THE E-COMMERCE SECURITY ENVIRONMENT

For most law-abiding citizens, the Internet holds the promise of a huge and convenient global marketplace, providing access to people, goods, services, and businesses worldwide, all at a bargain price. For criminals, the Internet has created entirely new—and lucrative—ways to steal from the more than 4.5 billion Internet users worldwide in 2022. From products and services, to money, and to information, it's all there for the taking on the Internet.

It's also less risky to steal online. Rather than rob someone in person, the Internet makes it possible to rob people remotely and almost anonymously. The potential for

anonymity on the Internet cloaks many criminals in legitimate-looking identities, allowing them to place fraudulent orders with online merchants or to steal information by impersonating other people or organizations. The Internet was never designed to be a global marketplace with billions of users and lacks many of the basic security features found in older networks such as the telephone system or broadcast television networks. By comparison, the Internet is an open, vulnerable-design network.

The actions of cybercriminals are costly for both businesses and consumers, who are then subjected to higher prices and additional security measures. The costs of malicious cyberactivity include not just the cost of the actual crime but also the additional costs that are required to secure networks and recover from cyberattacks, the potential reputational damage to the affected company as well as reduced trust in online activities, the loss of potentially sensitive business information (including intellectual property and confidential business information), and the cost of opportunities lost because of service disruptions.

THE SCOPE OF THE PROBLEM

Cybercrime is a significant problem for both organizations and consumers. But despite the increasing attention being paid to cybercrime, it is difficult to accurately estimate the actual amount of such crime, in part because many companies are hesitant to report it due to the fear of losing the trust of their customers and because even if the crime is reported, it may be difficult to quantify the actual dollar amount of the loss. According to a Center for Strategic and International Studies (CSIS)/McAfee report, the global cost of cybercrime in 2020 was more than $1 trillion. Other researchers believe the cost is even higher: For instance, Cybersecurity Ventures estimated the global cost in 2021 was more than $6 trillion and that the cost will grow to almost $11 trillion by 2025 (CSIS/McAfee, 2020; CyberSecurity Ventures, 2021).

One way of delving further into this issue is to look at the cost of specific types of cybercrime. A data breach (discussed further later in the chapter) is one of the most common types of cybercrime. According to the IBM Security/Ponemon Institute's 2021 Cost of a Data Breach Report, the total average cost of a data breach among the 537 companies surveyed globally was $4.2 million, a 10% increase from the previous year. The United States was the top country in terms of average total cost, at $9 million. The healthcare and financial services industries reported the highest average total cost, at $9.2 million and $5.7 million, respectively. Lost business represented almost 40% of the cost (IBM Security, 2021).

The Underground Economy Marketplace: The Value of Stolen Information

Criminals who steal information on the Internet do not always use this information themselves but, instead, derive value by selling the information to others on the so-called underground or shadow economy market, also sometimes referred to as the Dark Web or the Darknet. Data is currency to cybercriminals and has a "street value" that can be monetized. There are several thousand known underground economy marketplaces around the world that sell stolen information, as well as malware, such as exploit kits, access to botnets, and more. Prices for various types of stolen data typically vary depending on the quantity being purchased, the supply available, and its "freshness." For example, the recent average price for an individual U.S. credit card number with a

cardholder name, expiration date, zip code, and CVV (the three-digit number printed on the back of the card) is around $17. Bank account or online account (such as PayPal) login credentials (depending on value and verification) go for around 10% of the account's balance. Bundles of personal information, such as social security number, name, date of birth, address, and phone number (known as a fullz) cost about $8 per record (Bischoff, 2021). Experts believe that the cost of stolen information has generally fallen as the tools of harvesting have increased the supply. On the demand side, the same efficiencies and opportunities provided by new technology have increased the number of people who want to use stolen information.

Finding these marketplaces and the servers that host them can be difficult for the average user (and for law enforcement agencies), and prospective participants are typically vetted by other criminals before access is granted. This vetting process takes place through, Tor (which enables anonymous communication), VPN services, and other encrypted messaging services, and sometimes involves exchanges of information and money (often Bitcoins, a form of digital cash that we discuss further in Section 5.5). There is a general hierarchy of cybercriminals in the marketplace, with low-level, nontechnical criminals who frequent "carder forums," where stolen credit and debit card data is sold, at the bottom; resellers in the middle acting as intermediaries; and the technical masterminds who create malicious code at the top.

So, what can we conclude about the overall size of cybercrime? Cybercrime is dynamic and changing all the time, with new risks appearing almost daily. The cost of losses to businesses is significant and growing. The managers of e-commerce companies must prepare for an ever-changing variety of criminal assaults and keep current in the latest security techniques.

WHAT IS GOOD E-COMMERCE SECURITY?

Anytime you go into a marketplace you take risks. Your prime risk as a consumer is that you do not get what you paid for. As a merchant in the market, your risk is that you don't get paid for what you sell: Thieves take merchandise and then either walk off without paying anything or pay with a fraudulent instrument, stolen credit card, or forged currency.

E-commerce merchants and consumers face many of the same risks as participants in traditional commerce, albeit in a digital environment. Theft is theft, regardless of whether it is digital theft or traditional theft. Burglary, breaking and entering, embezzlement, trespass, malicious destruction, vandalism—all crimes in a traditional commercial environment—are also present in e-commerce. However, reducing risks in e-commerce is a complex process that involves new technologies, organizational policies and procedures, and new laws and industry standards that empower law enforcement officials to investigate and prosecute offenders. **Figure 5.1** illustrates the multi-layered nature of e-commerce security. (View the Figure 5.1 video in the eText for an animated and more detailed discussion of this figure.)

To achieve the highest degree of security possible, various technologies are available and should be used. But these technologies by themselves do not solve the problem. Organizational policies and procedures are required to ensure the technologies are not subverted. Finally, industry standards and government laws are required to enforce payment mechanisms, as well as to investigate and prosecute violators of laws designed to protect the transfer of property in commercial transactions.

FIGURE 5.1 THE E-COMMERCE SECURITY ENVIRONMENT

E-commerce security is multi-layered and must take into account new technologies, policies and procedures, and laws and industry standards.

The history of security in commercial transactions teaches us that any security system can be broken if enough resources are targeted against it. Security is not absolute. In addition, perfect security of every item is not needed forever, especially in the information age. There is a time value to information—just as there is to money. Sometimes it is sufficient to protect a message for a few hours or days. Also, because security is costly, we always have to weigh the cost against the potential loss. Finally, we have also learned that security is a chain that breaks most often at the weakest link. Our locks are often much stronger than our management of the keys.

Good e-commerce security requires a set of laws, procedures, policies, and technologies that, to the extent feasible, protect individuals and organizations from unexpected behavior in the e-commerce marketplace.

DIMENSIONS OF E-COMMERCE SECURITY

There are six key dimensions to e-commerce security: integrity, nonrepudiation, authenticity, confidentiality, privacy, and availability.

Integrity refers to the ability to ensure that the information being displayed on a website, or transmitted or received over the Internet, has not been altered in any way by an unauthorized party. For example, if an unauthorized person intercepts and changes the contents of an online communication, such as by redirecting a bank wire transfer into a different account, the integrity of the message has been compromised because the communication no longer represents what the original sender intended.

integrity
the ability to ensure that the information being displayed on a website or transmitted or received over the Internet has not been altered in any way by an unauthorized party

nonrepudiation
the ability to ensure that e-commerce participants do not deny (i.e., repudiate) their online actions

Nonrepudiation refers to the ability to ensure that e-commerce participants do not deny (i.e., repudiate) their online actions. For instance, the availability of free e-mail accounts with alias names makes it easy for a person to post comments or send a message and perhaps later deny doing so. Even when a customer uses a real name and e-mail address, it is easy for that customer to order merchandise online and then later deny doing so. In most cases, because merchants typically do not obtain a physical copy of a signature, the credit card issuer will side with the customer because the merchant has no legally valid proof that the customer ordered the merchandise.

authenticity
the ability to identify the identity of a person or entity with whom you are dealing on the Internet

Authenticity refers to the ability to identify the identity of a person or entity with whom you are dealing on the Internet. How does the customer know that the website operator is who it claims to be? How can the merchant be assured that customers really are who they say they are? Someone who claims to be someone he is not is "spoofing" or misrepresenting himself.

confidentiality
the ability to ensure that messages and data are available only to those who are authorized to view them

Confidentiality refers to the ability to ensure that messages and data are available only to those who are authorized to view them. Confidentiality is sometimes confused with **privacy**, which refers to the ability to control the use of information a customer provides about himself or herself to an e-commerce merchant.

privacy
the ability to control the use of information about oneself

E-commerce merchants have two concerns related to privacy. They must establish internal policies that govern their own use of customer information, and they must protect that information from illegitimate or unauthorized use. For example, if hackers break into an e-commerce site and gain access to credit card or other information, this violates not only the confidentiality of the data but also the privacy of the individuals who supplied the information.

availability
the ability to ensure that an e-commerce site or app continues to function as intended

Availability refers to the ability to ensure that an e-commerce site or app continues to function as intended.

Table 5.2 summarizes these dimensions from both the merchant's and the customer's perspectives. E-commerce security is designed to protect these six dimensions. When any one of them is compromised, overall security suffers.

THE TENSION BETWEEN SECURITY AND OTHER VALUES

Can there be too much security? The answer is yes. Contrary to what some may believe, security is not an unmitigated good. Computer security adds overhead and expense to business operations and often complicates the process of making a purchase.

There are inevitable tensions between security and ease of use. When traditional merchants are so fearful of robbers that they do business in shops locked behind security gates, customers may be hesitant to walk in. The same can be true with respect to e-commerce. In general, the more security measures added to an e-commerce site, the more difficult it is to use and the slower the site becomes. As you will discover while reading this chapter, digital security is purchased at the price of slowing down processors and adding significantly to data storage demands on storage devices. Security is a technological and business overhead that can detract from doing business. Too much security can harm profitability, while not enough security can potentially put you out of business. One solution is to implement an adaptive approach to security, for instance, by segmenting users by risk profile and previous interactions with the organization. Another is to adjust security settings to the user's preferences.

TABLE 5.2 CUSTOMER AND MERCHANT PERSPECTIVES ON THE DIFFERENT DIMENSIONS OF E-COMMERCE SECURITY

DIMENSION	CUSTOMER'S PERSPECTIVE	MERCHANT'S PERSPECTIVE
Integrity	Has information I transmitted or received been altered?	Has data been altered without authorization? Is data being received from customers valid?
Nonrepudiation	Can a party to an action with me later deny taking the action?	Can a customer deny ordering products?
Authenticity	Whom am I dealing with? How can I be assured that the person or entity is who they claim to be?	What is the real identity of the customer?
Confidentiality	Can someone other than the intended recipient read my messages?	Are messages or confidential data accessible to anyone other than those authorized to view them?
Privacy	Can I control the use of the personal information that I am transmitting to an e-commerce merchant?	What use, if any, can be made of personal data collected as part of an e-commerce transaction? Is the personal information of customers being used in an unauthorized manner?
Availability	Can I access the site or app?	Is the site or app operational?

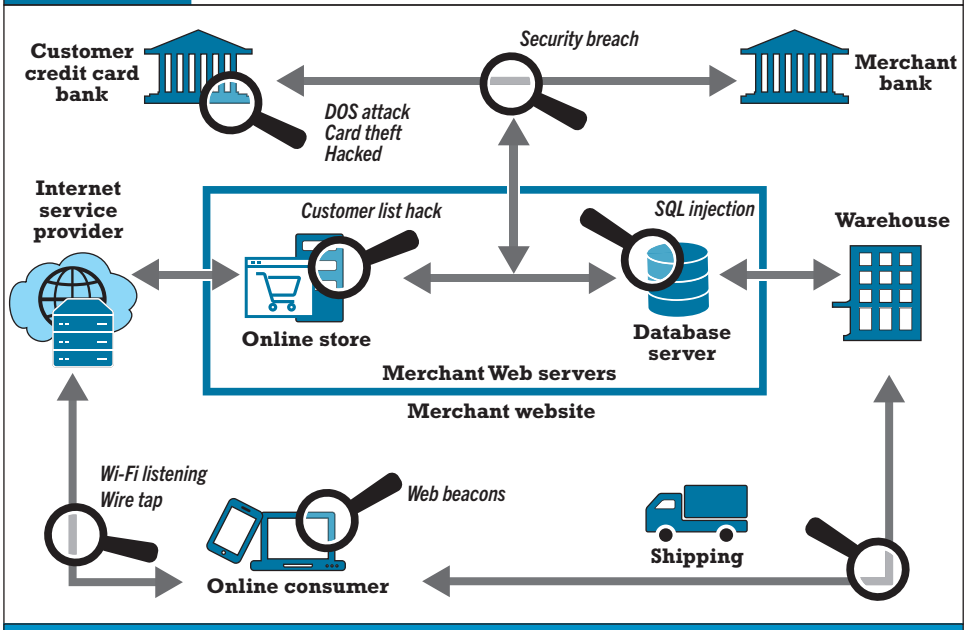
Over the last few years, with the occurrence of so many high-profile data breaches, consumers' tolerance for enhanced security has increased. A recent survey found that security is at the forefront of users' concerns, with the majority saying that security mattered more to them than even online privacy. At the same time, they value convenience and want an easy, quick shopping experience (Lourenco, 2020).

5.2 SECURITY THREATS IN THE E-COMMERCE ENVIRONMENT

From a technology perspective, there are three key points of vulnerability when dealing with e-commerce: the client, the server, and the communications pipeline. **Figure 5.2** illustrates some of the things that can go wrong at each major vulnerability point in the transaction—at the client level, at the server level, and over Internet communications channels.

In this section, we describe a number of the most common and most damaging forms of security threats to e-commerce consumers and site operators: malicious code, potentially unwanted programs, phishing, hacking and cybervandalism, data breaches, credit card fraud/theft, spoofing, pharming, spam (junk) websites (link farms), identity fraud, Denial of Service (DoS) and DDoS attacks, sniffing, insider attacks, and poorly designed server and client software, as well as security issues with respect to social networks, the mobile platform, cloud computing, the Internet of Things (IoT), and the metaverse.

FIGURE 5.2 VULNERABLE POINTS IN AN E-COMMERCE TRANSACTION



There are three major vulnerable points in e-commerce transactions: clients, servers, and Internet communications.

MALICIOUS CODE

malicious code (malware) includes a variety of threats such as viruses, worms, Trojan horses, and bots

Malicious code (sometimes referred to as "**malware**") includes a variety of threats such as viruses, worms, ransomware, Trojan horses, and bots. Some malicious code, sometimes referred to as an *exploit*, is designed to take advantage of software vulnerabilities in a computer's operating system, web browser, applications, or other software components. In the past, malicious code was often intended to simply impair computers and was often created by amateur hackers, but increasingly it involves a group of hackers (or a nation-state-supported group), and the intent is to steal e-mail addresses, logon credentials, personal data, and financial information. It's the difference between petty crime and organized crime.

exploit kit collection of exploits bundled together and rented or sold as a commercial product

Exploit kits are collections of exploits bundled together and rented or sold as a commercial product, often with slick user interfaces and in-depth analytics functionality. Use of an exploit kit typically does not require much technical skill, enabling novices to become cybercriminals. The incidence of malicious code is significantly increasing. For instance, Malwarebytes reports that in 2021, it detected 77% more malicious software attacks than it had detected in 2020 (Malwarebytes Labs, 2022a).

drive-by download malware that comes with a downloaded file that a user requests

Malware is often delivered in the form of a malicious attachment to an e-mail or is embedded as a link in the e-mail. Malicious links can also be placed in innocent-looking Microsoft Word or Excel documents. The links lead directly to a malicious code download or websites that include malicious code. A **drive-by download** is malware that comes with a downloaded file that a user intentionally or unintentionally requests. Drive-by downloads are now one of the most common methods of infecting computers. Malicious code embedded in PDF files also is common.

Another method for malicious code distribution is to embed it in the online advertising chain (known as **malvertising**), including via Google and other ad networks. As the ad network chain becomes more complicated, it becomes increasingly difficult for companies to vet ads placed on their websites and apps to ensure they are malware-free. One way users can combat malicious ads is by installing ad blockers. Google is also taking steps to block malvertising and in 2021, blocked 3.4 billion "bad ads" that it said violated its policies (Spencer, 2022; Malwarebytes, 2022b). Much of the malvertising in past years was in the form of drive-by downloads that exploited the frequent zero-day vulnerabilities that plagued Adobe Flash, which was often used for online advertisements. As a result, the Internet Advertising Bureau urged advertisers to abandon Adobe Flash in favor of HTML5, and Mozilla Firefox, Apple's Safari, and Google's Chrome browser all now block Flash advertisements from autoplaying. Amazon also stopped accepting Flash ads, and Adobe no longer distributes or updates the Flash Player.

malvertising
online advertising that contains malicious code

A **virus** is a computer program that can replicate or make copies of itself and spread to other files. In addition to the ability to replicate, most computer viruses deliver a "payload." The payload may be relatively benign, such as the display of a message or image, or it may be highly destructive—destroying files, reformatting the computer's hard drive, or causing programs to run improperly.

virus
a computer program that can replicate or make copies of itself and spread to other files

Viruses are often combined with a worm. Instead of just spreading from file to file, a **worm** is designed to spread from computer to computer. A worm does not necessarily need to be activated by a user or program in order to replicate itself. The Slammer worm is one of the most notorious. Slammer targeted a known vulnerability in Microsoft's SQL Server database software and infected more than 90% of vulnerable computers worldwide within 10 minutes of its release on the Internet. The Conficker worm (also known as Downadup) is reportedly one of the most persistent worms ever created and reportedly infected 11 million computers worldwide. A massive industry effort defeated its initial attempt to establish a global botnet, but it still remains a threat, particularly for older Windows or other legacy systems (Bowden, 2019).

worm
malware that is designed to spread from computer to computer

Ransomware is a type of malware (often a worm) that blocks or limits access to a computer or network by encrypting files and then demanding a ransom payment, typically in a cryptocurrency such as Bitcoin, in exchange for the decryption key. If the victim does not comply within the time allowed, the files will never be able to be decrypted. The first time most people became aware of ransomware was in 2013, when Cryptolocker infected more than 250,000 systems. Since then, ransomware has evolved from targeting individuals to instead targeting entire organizations and has become a significant threat. The growth of ransomware is also related to the growth of the virtual currency Bitcoin. In 2017, WannaCry, the most widespread ransomware attack to date, infected more than 230,000 computers in more than 150 countries, including computers in Britain's National Health Service, Telefónica (Spain's telecommunications system), FedEx, and Deutsche Bahn (Germany's main rail system). WannaCry exploited a software vulnerability called EternalBlue in older versions of the Windows operating system to replicate itself and spread. Further ransomware attacks have continued, including two high-profile attacks in 2021, the first on Colonial Pipeline, one of the largest fuel pipelines in the United States, and the second on JBS, one of the largest U.S. meat suppliers, profiled in the *Insight on Society* case, *Ransomware Everywhere*.

ransomware
malware that blocks or limits access to a computer or network by encrypting files and then demanding a ransom payment, typically in a cyryptocurrency such as Bitcoin, in exchange for the decryption key

INSIGHT ON SOCIETY

RANSOMWARE EVERYWHERE

In 2013, a "new" form of malware began to attract public attention. Cryptolocker was the first high-profile example of ransomware: malware that blocks or limits access to a computer or network by encrypting files and then demands a ransom payment, typically in a cryptocurrency such as Bitcoin, in exchange for the decryption key. Since then, ransomware has become a significant threat. For instance, the NotPetya ransomware attack caused an estimated $10 billion in damages to businesses worldwide. But while the general public may have been only vaguely aware of ransomware, that all changed in 2021, when two attacks, the first on Colonial Pipeline and the second on meatpacking giant JBS, thrust the dangers that ransomware poses to the forefront.

Colonial Pipeline operates a 5,500-mile pipeline system that runs from Texas to New Jersey and transports nearly half of all fuel for the East Coast of the United States. On May 6, 2021, hackers launched an attack on Colonial Pipeline, stealing 100 gigabytes of data (which it threatened to leak online) before locking its computers with ransomware and demanding payment. In response, the company proactively shut down some of its computer systems to contain the threat, which resulted in the complete shutdown of all its pipeline operations. The impact of the shutdown was immediate. It set off a cascading crisis that led to long lines and panicked buying at gas pumps, fuel stations running out of gas, a jump in gas prices, shortages of airline fuel, and emergency meetings at the White House. On May 7, to avert the crisis, Colonial Pipeline agreed to pay the hackers the ransom fee—75 Bitcoin, at the time worth nearly $5 million—and began the process of bringing its various systems back online. On May 12, Colonial Pipeline restarted its pipeline operations, although it took several days thereafter for the delivery supply chain to return to normal.

JBS is the world's largest beef-, pork-, and poultry-processing company, with operations throughout the world. JBS processes roughly 25% of the U.S. beef and 20% of its pork supply, and its subsidiary Pilgrim's Pride is the second-largest U.S. poultry processor. On May 30, 2021, hackers hit JBS with ransomware. Its IT team immediately began to shut down various systems to slow the attack's advance and halted operations at most of its plants in the United States as well as in Australia and Canada. The attack forced wholesale buyers to scramble for alternatives, putting pressure on meat and poultry supplies at a time when the food-supply chain was already under strain because of the impacts of the Covid-19 pandemic. Although JBS maintained a secondary backup of all its data and was able to bring back operations using those backup systems, it decided to pay $11 million in ransom to avert further potential risks.

Subsequent investigations showed that the Colonial Pipeline hackers, identified as part of a hacking group known as DarkSide (which was linked to the notorious Russian-based REvil/Sodinokibi ransomware gang), were able to enter Colonial Pipeline's network through a single compromised password. The account did not require multi-factor authentication, which made gaining access easier. In addition, because of the pandemic, Colonial Pipeline had deferred a voluntary federal security review of its facilities

by the TSA, which oversees pipeline security. Its last previous review had been in 2018. Whether a review might have helped it avoid the attack is unknown. Similarly, researchers believe the JBS ransomware attack began with leaked credentials in March 2021. Hackers then began to extract data from JBS's networks over a period of three months, finally launching the attack at the end of May. According to the U.S. government, the REvil/Sodinokibi group was responsible for this attack as well. A Congressional investigation identified two key lessons from the attacks. First, small lapses in security led to major breaches. Second, the companies lacked clear initial points of contact with the federal government, with each of the companies notifying a variety of different federal agencies, leading to delays in response.

The Colonial Pipeline and JBS attacks highlight the risks that ransomware poses to critical infrastructure, with senior U.S. government officials characterizing it as an urgent national security threat. In the energy and food supply sectors, mergers and acquisitions have created industry giants, creating single points of failure for entire industries and making them prime targets for hackers. Historically, these industries have not considered themselves as targets, nor have they been subject to as stringent cybersecurity regulations and requirements as some other industry sectors, such as the financial services industry. Local and regional governments, hospitals, school systems, and managed service providers (MSPs) have also increasingly come under ransomware attacks. Many of these organizations do not have advanced security safeguards in place.

Companies and governments have made only limited progress in combating ransomware thus far. But there have been some successes. In June 2021, the FBI was able to retrieve from a virtual wallet about half of the ransom fee paid by Colonial Pipeline. In November 2021, the U.S. Justice Department indicted a Russian national and alleged REvil/Sodinokibi member and seized $6.1 million in digital currency tied to him. In January 2022, the Russian government arrested 14 members of the REvil/Sodinokibi ransomware group and seized cash, cryptocurrency wallets, and high-end cars purchased by members of the group. But whether these efforts will have any long-lasting impact remains unknown, as new ransomware groups and threats seem to continually emerge. Experts suggest that effective ransomware prevention will require continuing international cooperation among all nations, even those who may be at odds politically; more advanced oversight of cryptocurrencies; and much better security practices by organizations.

SOURCES: "Russia Arrests Hackers Tied to Major U.S. Ransomware Attacks, Including Colonial Pipeline Disruption," by Dustin Volz and Robert McMillan, *Wall Street Journal*, January 14, 2022; "The Year the Tide Turned on Ransomware," by Carly Page, Techcrunch.com, December 30, 2021; "We Can Neither Regulate Nor Sanction Away Cryptocurrency's Facilitation of Ransomware," by Joel Schwarz, Isaca.org, December 20, 2021; "Lessons from Ransomware Payments by CAN, JBS, and Colonial Pipeline," by Andrew Simpson, Insurancejournal.com, December 6, 2021; "How to Control Ransomware? International Cooperation, Disrupting Payments Are Key, Experts Say," by Andrada Fiscutean, Csoonline.com, July 5, 2021; "JBS Paid $11 Million to Resolve Ransomware Attack," by Jacob Bunge, *Wall Street Journal*, June 9, 2021; "JBS Ransomware Attack Started in March and Much Larger in Scope than Previously Identified," by Ryan Sherstobitoff, Securityscorecard.com, June 8, 2021; "Colonial Pipeline Hackers Entered Network through a Single Compromised Password," by Dev Kundaliya, Computing.co.uk, June 7, 2021; Daniel Volz, Sadie Gurman, and David Uberti, "U.S. Retrieves Millions in Ransom Paid to Colonial Pipeline Hackers," *Wall Street Journal*, June 7, 2021; "How Mass Consolidations Turned Food, Energy Firms into Hacking Targets," by Lydia Mulvany and David Wethe, Bloomberg.com, June 3, 2021; "Cyber Attack Disrupts Meatpacking Giant JBS," by Dev Kundaliya, Computing.co.uk, June 2, 2021; "Colonial Pipeline Missed Requested Security Review before Hack," by David Uberti, *Wall Street Journal*, May 26, 2021; "Colonial Pipeline Paid Roughly $5 Million in Ransom to Hackers," Michael Shear, Nicole Perlroth, and Clifford Krauss, *New York Times*, May 13, 2021; "Colonial Pipeline Shutdown: Is There a Gas Shortage and When Will the Pipeline Be Fixed?," by Collin Eaton and Amrith Ramkumar, *Wall Street Journal*, May 12, 2021; "What We Know about the Colonial Pipeline Ransomware Attack," by Catherine Thorbecke and Luke Barr, Abcnews.com, May 10, 2021.

Trojan horse
appears to be benign but then does something other than expected. Often a way for viruses or other malicious code to be introduced into a computer system

A **Trojan horse** is software that appears to be benign but then does something other than expected. The Trojan horse is not itself a virus because it does not replicate but is often a way for viruses or other malicious code such as bots or *rootkits* (a program whose aim is to subvert control of the computer's operating system) to be introduced into a computer system. The term comes from Homer's *Iliad* and refers to the huge wooden horse that the Greeks used to trick the Trojans into opening the gates to Troy during the Trojan War. The horse secretly contained hundreds of Greek soldiers. In today's world, Trojan downloaders and droppers (Trojans that install malicious files into a computer they have infected by either downloading them from a remote computer or from a copy contained in their own code) are a common type of malware. Trojan horses are often used for financial malware distributed via botnets. One early example is Zeus, which steals information by keystroke logging and has infected more than 10 million computers since it first became known in 2007. Other examples include two Trojan families, Emotet and Trickbot, that evolved from banking Trojans into botnets. Although Trickbot has reportedly been retired, Emotet remains a threat. In 2021, Trojans accounted for 20% of the malware detected by Malwarebytes Labs (Malwarebytes Labs, 2022a; Arntz, 2022; Hoffman, 2022a).

backdoor
malware feature that allows an attacker to covertly access a compromised computer or network

A **backdoor** is a malware feature that allows an attacker to covertly access a compromised computer or network. Conficker/Downadup is an example of a worm with a backdoor.

bot
type of malicious code that can be covertly installed on a computer when connected to the Internet. Once installed, the bot responds to external commands sent by the attacker

botnet
collection of captured bot computers

Bots are a type of malicious code that can be covertly installed on your computer when attached to the Internet. Once installed, the bot responds to external commands sent by the attacker: Your computer becomes a "zombie" and is able to be controlled by an external third party (the "bot-herder"). **Botnets** are collections of captured computers used for malicious activities such as sending spam, participating in a DDoS attack or credential stuffing campaign (malicious login attempts), stealing information from computers, and storing network traffic for later analysis. The number of botnets operating worldwide is not known but is estimated to be well in the thousands, potentially controlling millions of computers. Bots and bot networks are significant threats because they can be used to launch very large-scale attacks using many different techniques. Over the years, governments throughout the world and industry leaders such as Microsoft have banded together to fight botnets, with a fair amount of success. For example, in 2021, an internationally coordinated effort took down many Emotet botnets. As a result of efforts such as these, the number of bots has significantly declined, especially in the United States, although they still continue to pose a threat.

Malicious code is a threat at both the client and the server levels, although servers generally have the benefit of much more thorough anti-malware protection than do consumers. At the server level, malicious code can bring down an entire website, preventing millions of people from using the site. Such incidents are relatively infrequent. Much more frequent malicious code attacks occur at the client level, and the damage can quickly spread to millions of other computers connected to the Internet. **Table 5.3** lists some well-known examples of malicious code.

potentially unwanted program (PUP)
program that installs itself on a computer, typically without the user's informed consent

POTENTIALLY UNWANTED PROGRAMS

In addition to malicious code, the e-commerce security environment is further challenged by **potentially unwanted programs (PUPs)**—also sometimes referred to as potentially unwanted applications (PUAs)—such as adware, browser parasites, spyware,

TABLE 5.3 NOTABLE EXAMPLES OF MALICIOUS CODE

NAME	TYPE	DESCRIPTION
Emotet	Trojan/Botnet	Described by Europol as the world's most dangerous malware. Initially used to steal bank login credentials by surreptitiously capturing people's keystrokes. Later versions added malware delivery services, including other Trojans and ransomware, and were spread via botnet. In January 2021, an internationally coordinated effort took down many Emotet botnets, but by November 2021, Emotet had once again resurfaced, indicating how difficult it is to fully eradicate.
WannaCry	Ransomware/ worm	Exploits vulnerabilities in older versions of Windows operating systems, encrypts data, and demands a ransom payment to decrypt them.
Cryptolocker	Ransomware/ Trojan	Hijacks users' data such as photos, videos, and documents, encrypts them with virtually unbreakable asymmetric encryption, and demands ransom payment for them.
Zeus	Trojan/botnet	Sometimes referred to as the king of financial malware. May install via drive-by download and evades detection by taking control of web browser and stealing data that is exchanged with bank servers.
Conficker	Worm	First appeared in 2008 and still a problem for users of older, unpatched Windows operating systems. Uses advanced malware techniques. Had nearly 10 million computers worldwide under its control.
Slammer	Worm	Launched in 2003. Caused widespread problems.
Melissa	Macro virus/ worm	First spotted in 1999. At the time, the fastest-spreading infectious program ever discovered. It attacked Microsoft Word's Normal.dot global template, ensuring infection of all newly created documents. It also mailed an infected Word file to the first 50 entries in each user's Microsoft Outlook Address Book.

and other applications including rogue security software, toolbars, and PC diagnostic tools that install themselves on a computer, typically without the user's informed consent. Such programs are increasingly found on social network and user-generated content sites where users are fooled into downloading them. Once installed, these applications are usually exceedingly difficult to remove from the computer. One example of a PUP is PCProtect, which infects PCs running Windows operating systems. PCProtect poses as a legitimate anti-malware program when in fact it is malware.

Adware is typically used to call for pop-up ads to display when the user visits certain sites. It is increasingly being used as a tool by cybercriminals. According to Malwarebytes Labs, adware comprised 13% of the malware it detected in 2021 (Malwarebytes, 2022b). A **browser parasite** (also sometimes referred to as a browser-setting hijacker) is a program that can monitor and change the settings of a user's browser: for instance, changing the browser's home page or sending information about the sites visited to a remote computer. Browser parasites are often a component of adware. **Cryptojacking** installs a browser parasite that sucks up a computer's processing power to mine cryptocurrency without the user's knowledge or consent. With the value of cryptocurrencies soaring in 2021, detections of cryptojacking malware increased by 300%, according to Malwarebytes (Malwarebytes, 2022a).

Spyware can be used to obtain information such as a user's keystrokes, and copies of e-mails and instant messages and can even take screenshots (and thereby capture passwords or other confidential data).

adware
a PUP that serves pop-up ads to your computer

browser parasite
a program that can monitor and change the settings of a user's browser

cryptojacking
installs a browser parasite that sucks up a computer's processing power to mine cryptocurrency without the user's knowledge or consent

spyware
a program used to obtain information such as a user's keystrokes, e-mails, instant messages, and so on

PHISHING

social engineering exploitation of human fallibility and gullibility to distribute malware

Social engineering relies on human curiosity, greed, gullibility, and fear in order to trick people into taking an action that enables a hacker to gain access to a computer system or results in the target downloading malware. For example, the online trading platform Robinhood said a social engineering attack in 2021 resulted in a data breach that exposed the data of 6 million customers. The attacker was able to convince a Robinhood support representative to install remote access software that provided the hacker with access to Robinhood's customer service systems (Ikeda, 2021).

phishing any deceptive, online attempt by a third party to obtain confidential information for financial gain

Phishing is any deceptive, online attempt by a third party to obtain confidential information for financial gain. Phishing attacks usually do not involve malicious code but instead typically rely on social engineering techniques. One of the most common phishing attacks is the e-mail scam letter, popularly known as a "Nigerian letter" scam. According to Palo Alto Networks' threat research group, Nigerian e-mail attacks, particularly those originating from a group of Nigerian cybercriminals known as SilverTerrier, have become much more sophisticated and a much more dangerous threat (Renals, 2021).

BEC (business e-mail compromise) phishing variation of Nigerian letter scam in which an attacker poses as a high-level employee of a company and requests that another employee transfer funds to what is actually a fraudulent account

BEC (business e-mail compromise) phishing is a variation of Nigerian letter scams. In BEC phishing, an attacker poses as a high-level employee of a company and requests that another employee transfer funds to what is actually a fraudulent account. One specific type of BEC phishing that has also become prevalent involves requests for employee information sent to payroll or human resources personnel by scammers impersonating high-level company executives. In 2022, the FBI's Internet Crime Complaint Center estimated that between 2016 and 2021, global losses resulting from BEC phishing had exceeded $43 billion (Pernet, 2022a).

Other phishing scams involve hackers sending e-mails that are purportedly from a trusted organization such as Amazon, eBay, PayPal, or Wells Fargo and that ask for account verification (known as *spear phishing*, or targeting a known customer of a specific business). Click on a link in the e-mail, and you will be taken to a website controlled by the scammer and then prompted to enter confidential information about your accounts, such as your account number and PIN codes. On any given day, millions of these phishing attack e-mails are sent, and, unfortunately, some people are fooled and disclose their personal account information. According to cyber security research firm Check Point Research, in the first quarter of 2022, LinkedIn was by far the brand most frequently imitated by hackers in phishing attacks, appearing in 52% of all such attacks (Check Point Software Technologies, Inc., 2022).

Phishers rely on traditional "con man" tactics but also use e-mail or other forms of online communication, such as social media or text messaging, to trick recipients into voluntarily giving out financial access codes, bank account numbers, credit card numbers, and other personal information. One newer technique makes use of a fake chatbot to build trust with potential victims. Often, phishers create (or "spoof") a website that purports to be a legitimate institution and cons users into entering financial information, or the site downloads malware such as a keylogger to the victim's computer. For example, in 2021, Meta, Facebook's parent company, filed a lawsuit seeking to disrupt phishing schemes designed to deceive users into sharing their user credentials on fake login pages for Facebook, Messenger, Instagram, and WhatsApp. The scheme involved the creation of more than 39,000 different websites. Phishers use the information they

gather to commit fraudulent acts such as charging items to your credit cards, withdrawing funds from your bank account, or engaging in other tactics to "steal your identity" (identity fraud) (Pernat, 2022b; Roth, 2021).

To combat phishing, leading e-mail service providers, including Google, Microsoft, Yahoo, and AOL, as well as financial services companies such as PayPal, Bank of America, and others joined together to form DMARC.org, an organization aimed at dramatically reducing e-mail address spoofing, in which attackers use real e-mail addresses to send phishing e-mails to victims who may be deceived because the e-mail appears to originate from a source the receiver trusts. The DMARC (Domain-based Message Authentication, Reporting, and Conformance) protocol offers a method of authenticating the origin of the e-mail and allows receivers to quarantine, report, or reject messages that fail to pass its test. The usage of DMARC has risen over the years, with more than 75% of Fortune 500 companies adopting DMARC policies for their e-mail domains. However, only 27% of those companies are completely enforcing its use. Given the increase in BEC phishing, more companies, particularly those in the financial services industries, are expected to embrace DMARC in the coming years (Hoffman, 2022b).

HACKING, CYBERVANDALISM, AND HACKTIVISM

A **hacker** is an individual who intends to gain unauthorized access to a computer system. Within the hacking community, the term **cracker** is typically used to denote a hacker with criminal intent, although in the public press, the terms hacker and cracker tend to be used interchangeably. Hackers and crackers gain unauthorized access by finding weaknesses in the security procedures of websites and computer systems. In the past, hackers and crackers typically were computer aficionados excited by the challenge of breaking into corporate and government websites. Today, most hackers have malicious intentions to disrupt, deface, or destroy sites (**cybervandalism**) or to steal personal or corporate information they can use for financial gain (data breach). During the Covid-19 pandemic, which created a surge of interest in the use of the videoconferencing tool Zoom (see the Chapter 3 *Insight on Technology* case for more information on Zoom), a new form of cybervandalism arose: "Zoombombing." Hackers, taking advantage of various Zoom security weaknesses, were able to invade Zoom meetings and broadcast pornography, racial slurs, and other disruptive content to meeting participants.

hacker
an individual who intends to gain unauthorized access to a computer system

cracker
within the hacking community, a term typically used to denote a hacker with criminal intent

cybervandalism
intentionally disrupting, defacing, or even destroying a site

hacktivism
cybervandalism and data theft for political purposes

Hacktivism adds a political twist to hacking. Hacktivists typically attack governments, organizations, and even individuals for political purposes, employing the tactics of cybervandalism, DDoS attacks, data thefts, and doxing (gathering and exposing personal information of public figures, typically from e-mails, social network posts, and other documents). They often strongly believe that information should be free, so sharing previously secret information is part of their mission. Some of the most notorious hacktivist organizations include WikiLeaks, LulzSec, and Anonymous. Another group, known as the Shadow Brokers, was responsible for releasing a number of hacking tools from the NSA and information about major software vulnerabilities, including the EternalBlue flaw used for the WannaCry ransomware attack.

Organizations sometimes hire *ethical hackers* to try to break into their systems from the outside in order to test their security measures. These types of hackers do their work under an agreement with the target firms that they will not be prosecuted for their efforts to break in. Firms such as Apple, Microsoft, Intel, HP, and many others are also often

willing to pay monetary bounties ("bug bounties") to hackers who discover bugs in these firms' software and hardware. Some companies in the blockchain and cryptocurrency sector offer to pay multimillion-dollar bounties to help them combat the relentless attacks by hackers seeking to break into their systems (Brumfield, 2022; Holland, 2020).

There are also hackers who believe they are pursuing some greater good by breaking in and revealing system flaws. These hackers discover weaknesses in a system's security and then publish the weaknesses without disrupting the site or attempting to profit from their finds. Their only reward is the prestige of discovering the weaknesses. Their actions are suspect, however, especially when such hackers reveal security flaws that make it easier for other criminals to gain access to a system.

DATA BREACHES

data breach occurs when an organization loses control over corporate information, including the personal information of customers and employees, to outsiders

credential stuffing brute force attack that hackers launch via botnets and automated tools using known username and password combinations obtained from data breaches

A **data breach** occurs whenever organizations lose control over corporate information, including the personal information of customers and employees, to outsiders. In 2021, the Identity Theft Resource Center recorded 1,862 data breaches and exposures, a 68% increase over 2020. More than 293 million people were impacted. Malicious code of various types, such as phishing and ransomware, were responsible for more than 85% of the breaches, while human and system errors were responsible for about 10%. More than 80% of the breaches involved sensitive records, such as names and full social security numbers (Identity Theft Resource Center, 2022). Data breaches are also an enabler for credential stuffing attacks. **Credential stuffing** is a brute force attack that hackers launch via botnets and automated tools using known username and password combinations (referred to as combo lists) obtained from data breaches. Credential stuffing attacks are becoming increasingly common, especially in the financial services industries, according to Akamai, which observed more than 193 billion attacks against customers using its services in 2020, with the number of attacks remaining similarly high in 2021 (Akamai Technologies, Inc., 2021a, 2021b).

Some of the most notorious data breaches that have come to light include the Yahoo data breach, believed to be the largest breach at a single company in history, which exposed the identity of every single user of Yahoo's e-mail service (a total of 3 billion people); the Marriott International data breach involving its Starwood guest reservation system, which exposed the personal data of almost 400 million people; and the Equifax data breach, in which an unpatched software vulnerability enabled hackers to access and download the personal data files of approximately 147 million U.S. consumers, or roughly 45% of the U.S. population, from systems operated by Equifax, one of the largest credit reporting and scoring firms in the United States. In 2021 and 2022, the trend continued. For instance, in August 2021, T-Mobile revealed its third major data breach in two years, when a hacker accessed the personal records, such as names, addresses, birthdates, phone numbers, and mobile phone serial numbers, of more than 50 million of its customers (FitzGerald, 2021).

CREDIT CARD FRAUD/THEFT

Theft of credit card data on the Internet is one of the most feared occurrences. Fear that credit card information will be stolen prevents users from making online purchases in many cases. Online merchants use a variety of techniques to combat credit card fraud, including using automated fraud detection tools, manually reviewing orders, rejecting

suspect orders, and requiring additional levels of security such as e-mail address, zip code, and CVV security codes.

U.S. federal law limits the liability of individuals to $50 for purchases made using a stolen credit card. For amounts more than $50, the credit card company generally pays the amount, although in some cases, the merchant may be held liable if it failed to verify the account or consult published lists of invalid cards. Banks recoup the cost of credit card fraud by charging higher interest rates on unpaid balances, and merchants typically raise prices to cover the losses. The U.S. credit card system has begun a shift to EMV credit cards, also known as smart cards or chip cards. Already widely used in Europe, EMV credit cards have a computer chip instead of a magnetic strip. EMV cards can also support contactless payment methods. While EMV technology cannot prevent data breaches from occurring, it has made it harder for criminals to profit from the mass theft of credit card numbers.

In the past, the most common cause of credit card fraud was a lost or stolen card that was used by someone else, followed by employee theft of customer numbers and stolen identities (criminals applying for credit cards using false identities). Today, the most frequent cause of stolen cards and card information is the systematic hacking and looting of a corporate server where the information on millions of credit card purchases is stored.

A central security issue of e-commerce is the difficulty of establishing a customer's identity. Currently there is no technology that can identify a person with absolute certainty. For instance, a lost or stolen EMV card can be used until the card is cancelled, just like a magnetic strip card can. Until a customer's identity can be guaranteed, online companies are at a higher risk of loss than traditional offline companies. The U.S. federal government has attempted to address this issue through the Electronic Signatures in Global and National Commerce Act (the "E-Sign" law), which gives digital signatures the same authority as hand-written signatures in commerce. This law is also intended to make digital signatures more commonplace and easier to use. Similar laws on the state level have been adopted using the framework provided by the Uniform Electronic Transaction Act (UETA). Although the use of e-signatures is still uncommon in the B2C retail e-commerce arena, many businesses have implemented e-signature solutions, particularly for B2B contracting, financial services, insurance, health care, and government and professional services. DocuSign, Adobe Sign, Citrix RightSignature, and OneSpan Sign are currently among the most widely adopted e-signature solutions. They use a variety of techniques, such as remote user identification through third-party databases or personal information verification such as a photo of a driver's license; multi-factor user authentication methods (user ID and password, e-mail address verification, secret question and answer, biometric identification); and public/private key encryption to create a digital signature and embedded audit trail that can be used to verify the e-signature's integrity. These companies also provide mobile signature solutions.

IDENTITY FRAUD

identity fraud involves the unauthorized use of another person's personal data for illegal financial benefit

Identity fraud involves the unauthorized use of another person's personal data, such as social security, driver's license, and/or credit card numbers, as well as usernames and passwords, for illegal financial benefit. Criminals can use such data to obtain loans, purchase merchandise, or obtain other services, such as mobile phone or other utility

services. Cybercriminals employ many of the techniques described previously, such as spyware, phishing, data breaches, and credit card theft, for the purpose of identity fraud. Data breaches, in particular, often lead to identity fraud.

Identity fraud is a significant problem in the United States. In 2021, according to Javelin Strategy & Research, about 15 million U.S. consumers suffered identity fraud. The total dollar losses resulting from identity fraud were approximately $24 billion. New account fraud, in which criminals used stolen personal information to open unauthorized accounts, such as credit card or merchant accounts, rose by more than 100% while account takeover losses increased by 90% (Javelin Strategy & Research, 2022).

SPOOFING, PHARMING, AND SPAM (JUNK) WEBSITES

spoofing
involves attempting to hide a true identity by using someone else's e-mail or IP address

pharming
automatically redirecting a web link to an address different from the intended one, with the site masquerading as the intended destination

Spoofing involves attempting to hide a true identity by using someone else's e-mail or IP address. For instance, a spoofed e-mail will have a forged sender e-mail address designed to mislead the receiver about who sent the e-mail. IP spoofing involves the creation of TCP/IP packets that use someone else's source IP address to give the impression that the packets are coming from a trusted host. Most current routers and firewalls can offer protection against IP spoofing. Spoofing a website sometimes involves **pharming**, automatically redirecting a web link to an address different from the intended one, with the site masquerading as the intended destination. Links that are designed to lead to one site can be reset to send users to a totally unrelated site—one that benefits the hacker.

Although spoofing and pharming do not directly damage files or network servers, they threaten the integrity of a site. For example, if hackers redirect customers to a fake website that looks almost exactly like the true site, they can then collect and process orders, effectively stealing business from the true site. Or if the intent is to disrupt rather than steal, hackers can alter orders—inflating them or changing the products ordered—and then send them on to the true site for processing and delivery. Customers become dissatisfied with the improper order shipment, and the company may have huge inventory fluctuations that impact its operations. In addition to threatening integrity, spoofing also threatens authenticity by making it difficult to discern the true sender of a message. Clever hackers can make it almost impossible to distinguish between a true and a fake identity or web address.

spam (junk) websites
also referred to as link farms; promise to offer products or services but, in fact, are just collections of advertisements

Spam (junk) websites (also sometimes referred to as *link farms*) are a little different. These are sites that promise to offer some product or service but, in fact, are just a collection of advertisements for other sites, some of which contain malicious code. For instance, you may search for "[name of town] weather" and then click on a link that promises the local weather, but then you discover that all the site does is display ads for weather-related products or other websites. Junk or spam websites typically appear on search results pages and do not involve e-mail. These sites sometimes cloak their identities by using domain names similar to legitimate firm names and redirect traffic to known spammer-redirection domains.

SNIFFING AND MAN-IN-THE-MIDDLE ATTACKS

sniffer
a type of eavesdropping program that monitors the information traveling over a network

A **sniffer** is a type of eavesdropping program that monitors the information traveling over a network. When used legitimately, sniffers can help identify potential network trouble-spots, but when used for criminal purposes, they can be damaging and very difficult to detect. Sniffers enable hackers to steal proprietary information, including

passwords, e-mail messages, company files, and confidential reports, from anywhere on a network.

A **man-in-the-middle (MitM) attack** also involves eavesdropping but is more active than a sniffing attack, which typically involves passive monitoring. In a MitM attack, the attacker can intercept communications between two parties who believe they are directly communicating with one another, when in fact the attacker is controlling the communications. This allows the attacker to change the contents of the communication.

man-in-the-middle (MitM) attack
attacker can intercept communications between two parties who believe they are directly communicating with one another, when in fact the attacker is controlling the communications

DENIAL OF SERVICE (DoS) AND DISTRIBUTED DENIAL OF SERVICE (DDoS) ATTACKS

In a **Denial of Service (DoS) attack**, hackers flood a website with useless pings or page requests that inundate and overwhelm the site's web servers. Increasingly, DoS attacks involve the use of bot networks and so-called "distributed attacks" built from thousands of compromised client computers. DoS attacks typically cause a website to shut down, making it impossible for users to access the site. For busy e-commerce sites, these attacks are costly: While the site is shut down, customers cannot make purchases. And the longer a site is shut down, the more damage is done to a site's reputation. Although such attacks do not destroy information or access restricted areas of the server, they can destroy a firm's online business. Often, DoS attacks are accompanied by attempts at extorting site owners to pay tens or hundreds of thousands of dollars to the hackers in return for stopping the DoS attack.

Denial of Service (DoS) attack
flooding a website with useless traffic to inundate and overwhelm the network

A **Distributed Denial of Service (DDoS) attack** uses hundreds or even thousands of computers to attack the target network from numerous launch points. DoS and DDoS attacks are threats to a system's operation because they can shut it down indefinitely. Major websites have experienced such attacks, making the companies aware of the need to continually introduce new measures to prevent future attacks. According to Neustar Security Services, the number of both large- and small-scale DDoS attacks continued to increase in 2021. A type of attack known as "carpet-bombing," which targets multiple IP addresses of an organization within a very short time rather than focusing on a single address, accounted for 44% of the total attacks (Neustar Security Services, 2022). Attacks are also increasing in power. For instance, the largest DDoS attack in the Internet's history thus far was launched in November 2021 against an unnamed Microsoft Azure customer, which used Azure's DDoS protection platform to mitigate the 3.45 Tbps (terabits per second) attack (Gatlan, 2022).

Distributed Denial of Service (DDoS) attack
using numerous computers to attack the target network from numerous launch points

The growth of the Internet of Things (IoT), with billions of Internet-connected things from refrigerators to security cameras that can be used to launch service requests against servers, also poses a new threat. For example, the Microsoft Azure attack originated from 10,000 different connected devices. Botnets also continue to play a key role in the launch of attacks. IoT botnets have become a preferred platform for launching DDoS attacks. One example is the Mirai botnet, which infected numerous IoT devices (such as Internet-connected surveillance cameras) and then used these devices to launch a DDoS attack against Dyn, whose servers monitor and reroute Internet traffic. The Mirai botnet overwhelmed the Dyn servers, taking down Etsy, GitHub, Netflix, Shopify, SoundCloud, Spotify, Twitter, and a number of other major websites. Internet infrastructure firm Cloudflare recently had to fight off another massive DDoS attack launched by a Mirai botnet comprised of more than 20,000 bots in 125 countries.

Another trend is DDoS smokescreening, in which attackers use a DDoS attack as a distraction while they insert malware or viruses or steal data. And not surprisingly, now that mobile data connections have become faster and more stable, hackers are beginning to harness mobile devices for mobile-based DDoS attacks.

INSIDER ATTACKS

We tend to think of security threats to a business as originating outside the organization. In fact, the largest financial threats to business institutions come not from robberies but from embezzlement by insiders. Bank employees steal far more money than do bank robbers. The same is true for e-commerce companies. Some of the largest disruptions to service, destruction to sites, and diversions of customer financial data and personal information have come from insiders—once-trusted employees. For instance, a Proofpoint/Ponemon Institute survey of more than 1,000 IT and IT security practitioners in 278 global organizations found that the number, frequency, and costs of insider incidents increased dramatically from 2019 to 2021, with the global average annual cost of an insider threat increasing by more than 33% to $15.4 million. Employees have access to privileged information, and, in the presence of sloppy internal security procedures, they are often able to roam throughout an organization's systems without leaving a trace. Research from Carnegie Mellon University documents the significant damage insiders have done to both private and public organizations. In some instances, the insider might not have criminal intent but inadvertently exposes data that can then be exploited by others. Companies must be equally concerned about accidental/unintentional data breaches resulting from user carelessness as they are about data breaches resulting from malicious insiders (Proofpoint/Ponemon Institute, 2022; Software Engineering Institute, 2019).

POORLY DESIGNED SOFTWARE

Many security threats prey on poorly designed software, sometimes in the operating system and sometimes in the application software, including browsers. The increase in complexity and size of software programs, coupled with demands for timely delivery to markets, has contributed to an increase in software flaws or vulnerabilities that hackers can exploit. For instance, **SQL injection (SQLi) attacks** take advantage of vulnerabilities in poorly coded web application software that fails to properly validate or filter data entered by a user on a web page to introduce malicious program code into a company's systems and networks. An attacker can use this input validation error to send a rogue SQL query to the underlying database to access the database, plant malicious code, or access other systems on the network. Large web applications have hundreds of places for inputting user data, each of which creates an opportunity for an SQLi attack. A large number of web-facing applications are believed to have SQLi vulnerabilities, and tools are available for hackers to check web applications for these vulnerabilities. According to Akamai, SQLi attacks were the top method for web application attacks between January 2020 and June 2021, accounting for more than 55% of all attacks (Akamai Technologies, Inc., 2021b).

SQL injection (SQLi) attack
takes advantage of poorly coded web application software that fails to properly validate or filter data entered by a user on a web page

Each year, security firms identify thousands of software vulnerabilities in web browsers; PC, Macintosh, and Linux software; as well as mobile device operating systems

and applications. For instance, the US-CERT National Vulnerability database recorded more than 18,000 separate software vulnerabilities in 2021 (Neustar Security Services, 2022). A **zero-day vulnerability** is one that has been previously unreported and for which no patch yet exists. According to a recent survey, senior security officials tabbed zero-day attacks as the second-biggest risk to endpoint security, just behind ransomware (Adaptiva/Ponemon Institute, 2022). The very design of the personal computer includes many open communication ports that can be used, and indeed are designed to be used, by external computers to send and receive messages. Ports that are frequently attacked include TCP port 445 (Microsoft-DS), port 80 (WWW/HTTP), and port 443 (TSL/SSL/HTTPS). Given their complexity and design objectives, all operating systems and application software, including Linux and Macintosh, have vulnerabilities.

zero-day vulnerability software vulnerability that has been previously unreported and for which no patch yet exists

The *Insight on Technology* case, *Race against Time: The Scramble to Fix the Log4Shell Vulnerability*, discusses a critical zero-day vulnerability, named Log4Shell, in a Java logging tool, Apache Log4j, that allows attackers to take control of susceptible servers. Because of its prevalence, experts think it may take months—if not years—to fix all the systems that use the tool.

SOCIAL NETWORK SECURITY ISSUES

Social networks like Facebook, Instagram, Twitter, TikTok, LinkedIn, and Pinterest provide a rich and rewarding environment for hackers. Viruses, site takeovers, identity fraud, malware-loaded apps, click hijacking, phishing, and spam are all found on social networks. For example, in 2020, a coordinated social engineering hack tricked several Twitter employees, enabling the hackers to take control of the Twitter accounts of dozens of the most prominent political, entertainment, and technology leaders in the United States and post a Bitcoin scam. Other common types of scams on social networks include manual sharing scams, in which victims unwittingly share videos, stories, and pictures that include links to malicious sites, and fake offerings that invite victims to join a fake event or group with incentives such as free gift cards and that require users to share their information with the attacker. Other techniques include fake Reactions buttons that, when clicked, install malware and post updates to the user's Newsfeed (further spreading the attack), and fake apps. By sneaking in among our friends, hackers can masquerade as friends and dupe users into scams.

Social network firms have thus far been relatively poor policers because they have failed to aggressively weed out accounts that send visitors to malware sites. Social networks are open: Anyone, even criminals, can set up an account. Most attacks are social engineering attacks that tempt visitors to click on links that seem authentic. Social apps downloaded from either the social network or an external website are not certified by the social network to be clean of malware. It's "clicker beware."

MOBILE PLATFORM SECURITY ISSUES

The explosion in mobile devices has broadened opportunities for hackers. Mobile users are filling their devices with personal and financial information and using them to conduct an increasing number of transactions, from retail purchases to mobile banking, making them excellent targets for hackers. In general, mobile devices face all the same risks as any Internet device as well as some new risks associated with wireless network

INSIGHT ON TECHNOLOGY

RACE AGAINST TIME: THE SCRAMBLE TO FIX THE LOG4SHELL VULNERABILITY

One Friday afternoon in December 2021, Jordan LaFontaine, the endpoint operations team leader at Southern New Hampshire University, got an urgent notice about a recently discovered software vulnerability, Log4Shell, that could potentially impact more than 7,500 computing devices under his team's supervision. LaFontaine was just one of many security professionals across the globe scrambling that weekend and in the days that followed to deal with a major zero-day vulnerability, one that was given the highest-possible severity score by the U.S. National Institute of Standards and Technology and characterized by the U.S. Cybersecurity and Infrastructure Security Agency as one of the most serious vulnerabilities seen in decades.

The vulnerability was discovered in Apache Software Foundation's (ASF's) Log4j, an open-source utility program created for the Java software development environment. ASF is an all-volunteer community that acts as a "steward" for open-source code and makes it available to programmers and end users free of charge. Log4j allows users to create a built-in "log," or record, of activity to troubleshoot issues and track data within their programs.

On November 24, 2021, a user had reported to ASF the discovery of a zero-day vulnerability in Log4j's software code. The Log4Shell vulnerability, as it came to be known, was very easy to exploit and required very little technical expertise. On December 9, the existence of the vulnerability was publicly disclosed, with Microsoft's Minecraft identified as the first big-name victim. The same day, ASF released a patch.

However, despite the existence of the patch, combating the Log4Shell vulnerability faced a number of difficulties. For starters, the Log4j program is used in a broad range of Java-based software products and web services, from security software to networking tools and to video game servers. The exact number of users of Log4j is unknown, but the software has reportedly been downloaded millions of times. A public catalog of products known to have the flaw has received more than 2,800 submissions. Apple's iCloud, Microsoft's Minecraft, and Google, Amazon, Twitter, LinkedIn, as well as many others were among the firms impacted. Microsoft warned that many organizations might not even be aware that Log4j was part of the applications they were using, meaning that they could be vulnerable without even knowing it. Even applications not written in Java often are hosted in web containers that use Java, meaning that a project could have no apparent dependence on Log4j but still be vulnerable. Security experts cautioned that it might take months, or even years, to fully eradicate the vulnerability.

As soon as the announcement was made, security firms began reporting on hacker attempts to exploit the flaw. Hackers know that organizations are often slow to patch even critical security flaws. By December 20, 2021, Check Point posted that it had stopped more than 4.3 million breach attempts, with known hacking groups accounting for more than 45% of those attempts. Some attacks involved exploiting the flaw to install cryptomining malware. Other attacks included delivering Cobalt Strike, a penetration-testing tool that hackers often use to steal usernames and passwords to

gain further access to networks. Other security firms reported similar activity. Cloudflare said that its researchers were seeing around 1,000 attempts per second to actively exploit the flaw. Bitdefender said that it had detected multiple attempts by attackers to use the Log4Shell vulnerability to deploy a new family of ransomware known as Khonsairi on vulnerable systems. Microsoft reported that it had observed hacking groups linked to China, Iran, North Korea, and Turkey launching attacks. The Belgian Ministry of Defense confirmed an attack on its computer network. Akamai researchers said that they had found evidence suggesting that attackers were using the Log4Shell vulnerability in Zyxel networking devices to spread malware used by the Mirai botnet. To make matters worse, between December 9 and December 28, three additional Log4j vulnerabilities were discovered, necessitating three separate, additional patches.

In addition to the patches issued by ASF, the larger open-source community sprang into action with various resources. For instance, open-source security provider WhiteSource released a free developer tool that organizations could use to detect and resolve Log4j vulnerabilities. Third-party vendors were also quick to release tools. CrowdStrike released a Log4j scanner just before Christmas, and shortly thereafter, Microsoft rolled out a Log4j dashboard for threat and vulnerability management. Cisco, Oracle, and VMware also issued patches and fixes to secure their own products. The Federal Trade Commission (FTC) threatened legal action against companies that did not take steps to fix the vulnerability, and the Securities and Exchange Commission indicated that it might do the same.

The Log4Shell vulnerability has highlighted security issues surrounding the use of open-source software. The issues are regarded as so serious that the White House national security advisor has described it as a key national security concern. The FTC has also expressed alarm, noting that although open-source software and services are critically important parts of the world's digital infrastructure (with the average application using 528 different open-source components), the software is created and maintained by volunteers, who don't always have adequate resources and personnel for incident response and proactive maintenance.

Google has pledged $100 million to support open-source development and fix vulnerabilities, while another Google project is focusing on how to audit and improve critical open-source projects. It may be that the Log4Shell vulnerability could ultimately have a silver lining: that of focusing attention on both the critical and the ubiquitous nature of open-source code in today's digital infrastructure and encouraging both governments and technology companies to take steps to try to ensure that a similar crisis does not happen in the future.

SOURCES: "DHS Creates Cyber Safety Review Board, Targets Log4j Exploit for Its First Report," by Corin Faife, Theverge.com, February 4, 2022; "The Log4Shell Vulnerability: A PostMortem," by Ariel Assaraf, Venturebeat.com, January 22. 2022; "Fixing Log4Shell: How a University Patched All Its Endpoints over a Weekend," by John Leonard, Computing.co.uk, January 13, 2022; "White House Hosts Tech Summit to Discuss Open-Source Security after Log4j," by Corin Faife, Theverge.com, January 13, 2022; "Cyber Officials Warn of Long-Term Fallout from Log4j Cyber Flaw," by Dustin Volz, *Wall Street Journal*, January 10, 2022; "FTC Warns Companies to Remediate Log4j Vulnerability," Ftc.gov, January 4, 2022; "Log4j Flaw Attack Levels Remain High, Microsoft Warns," by Liam Tung, Zdnet.com, January 4, 2022; "The Internet Runs on Free Open-Source Software. Who Pays to Fix It?," by Patrick Howell O'Neill, Technologyreview.com, December 17, 2021; "Log4j Flaw: Critical Zero-Day Leaves Millions of Systems at Risk," by Ojasiv Nath, Toolbox.com, December 15, 2021; "Log4j Vulnerability: Why Your Hot Take on It Is Wrong," by Matt Asay, Techrepublic.com, December 15, 2021; "Critical Log4Shell Security Flaw Lets Hackers Compromise Vulnerable Servers," by Lance Whitney, Techrepublic.com, December 13, 2021.

security. For instance, public Wi-Fi networks that are not secured are very susceptible to hacking. A flaw in an older version (WPA2) of the Wi-Fi security protocol allowed hackers to intercept passwords, e-mails, and other traffic on Wi-Fi networks. While most people are aware that computers and websites may be hacked and may contain malware, many people believe their smartphones are as secure as a traditional, landline phone.

Mobile cell phone malware (sometimes referred to as malicious mobile apps [MMAs] or rogue mobile apps) was developed as early as 2004 with Cabir, a Bluetooth worm affecting Symbian operating systems (Nokia phones) and causing the phone to continuously seek out other Bluetooth-enabled devices, quickly draining the battery. The iKee.B worm, first discovered in 2009, only two years after the iPhone was introduced, infected jailbroken (altered to allow hacked versions of iOS to install third-party apps) iPhones, turning the phones into botnet-controlled devices. An iPhone in Europe could thus be hacked by an iPhone in the United States, with all its private data sent to a server in Poland. IKee.B established the feasibility of cell phone botnets. In 2014, the first attack on iPhones that were not jailbroken occurred, via malware known as Wirelurker.

In 2021, security firm Kaspersky detected more than 3.4 million mobile malicious installation packages, more than 97,000 new mobile banking Trojans, and more than 17,000 new mobile ransomware Trojans. *Madware*—innocent-looking apps that contain adware that launches pop-up ads and text messages on your mobile device—accounts for the largest share of detected threats.

The majority of mobile malware still targets Android devices, which are much more likely to be infected with malware compared to iOS devices. This is due in part to the fact that Android users can download apps from third-party stores that are poorly regulated, whereas Apple users are confined to the more tightly controlled App Store. Google uses an automated screening technique called Google Play Protect to detect malicious apps and wipe them from the Google Play store. Google can also perform a remote wipe of offending apps from Android phones without user intervention. In addition, Google re-architected the Android operating system to separate hardware-specific code from the rest of Android, allowing Google to patch vulnerabilities and other security issues more quickly. Still, this only helps users get rid of malware faster; it can't stop Android phones from being infected.

Apple IoS devices are beginning to be increasingly targeted as well. Apple claims that it examines every app to ensure that each one follows Apple's App Store rules, but risks remain. Hackers can download apps and republish those same apps, with malware embedded, to the App Store. Hackers also buy apps from their original developers and embed malware in a similar manner. Apple's iOS operating system has also been subject to breaches. Updates to iOS in 2016 exposed a series of vulnerabilities, collectively known as Trident, that allowed attackers to take complete control of a phone remotely, using malware called Pegasus. Although Apple quickly scrambled to fix the vulnerability, releasing an operating system update in 10 days, Trident and Pegasus showed that the iOS operating system is not as impervious to malware as many users believe. In 2021, it was revealed that iPhones were being hacked by Pegasus spyware distributed by an Israeli security company and used to capture contact information and live audio. In July 2022, Apple announced that it would be introducing a new iOS operating system feature that when activated, would block most types of attachments on messages and prevent

the phone from previewing web links, both of which are frequently used to transmit spyware such as Pegasus as well as other types of malware (Menn, 2022).

Beyond the threat of rogue apps, smartphones of all types are susceptible to browser-based malware, often received via unsafe wireless networks. In addition, most smartphones, including the iPhone, permit manufacturers to remotely download configuration files to update operating systems and security protections. Unfortunately, flaws in the public key encryption procedures that permit remote server access to iPhones have been discovered, raising further questions about the security of such operations. Attackers have also developed methods of hijacking phones using weaknesses in SIM cards. The defects allow hackers to obtain the encryption key that guards users' personal information, granting hackers nearly complete access over the phone in the process. Many users don't even take advantage of the security features they have available to them, such as the use of a lock screen.

Smishing attacks exploit SMS/text messages. Compromised text messages can contain e-mail and website addresses that can lead the innocent user to a malware site. Smishing attacks are effective because users have become conditioned to quickly open and read SMS/text messages, and many tend to be less suspicious of texts than they are of e-mail. In addition, smishing attacks are inexpensive to develop and deploy. Criminal SMS spoofing services have emerged, which conceal the cybercriminal's true phone number by replacing it with a false alpha-numeric name. SMS spoofing can also be used by cybercriminals to lure mobile users to a malicious website by sending a text that appears in the From field to be from a legitimate organization and suggesting the receiver click on what is actually a malicious URL hyperlink to update an account or obtain a gift card (Kaspersky, 2022; McAfee, 2022; Akamai, 2021a).

CLOUD SECURITY ISSUES

The move of so many Internet services into the cloud also raises security risks. From an infrastructure standpoint, DDoS attacks threaten the availability of cloud services on which more and more companies are relying. For instance, as previously noted, the DDoS attack on Dyn caused a major disruption to cloud services across the United States. Companies that have hybrid networks, with their applications scattered among public clouds, private clouds, and on-premises systems, are most at risk. Safeguarding data being maintained in a public cloud environment is also a major concern. According to a recent survey, more than 25% of organizations experienced a public cloud security incident in 2021, up 10% from the previous year (Cybersecurity Insiders/Check Point, 2022). A recent survey of around 2,800 information security and information technology personnel found that more than half believe using cloud services makes it more difficult to protect sensitive data. The survey also found that most organizations are not taking full responsibility for the security of their data in the cloud, instead looking to their cloud providers to provide that security (Thales/Ponemon Institute, 2022).

INTERNET OF THINGS SECURITY ISSUES

As you learned in Chapter 3, IoT involves the use of the Internet to connect a wide variety of sensors, devices, and machines and is powering the development of a multitude of smart connected things, such as home electronics (smart TVs, thermostats, home

security systems, and more), connected cars, medical devices, and industrial equipment that supports manufacturing, energy, transportation, and other industrial sectors. IoT raises a host of security issues that are in some ways similar to existing security issues but are even more challenging, given the need to deal with a wider range of devices that operate in a less controlled, global environment and that have an expanded range of attack. In a world of connected things, the devices, the data produced and used by the devices, and the systems and applications supported by those devices can all potentially be attacked. **Table 5.4** takes a closer look at some of the unique security challenges posed by IoT identified by the Internet Society (ISOC), a consortium of corporations, government agencies, and nonprofit organizations that monitors Internet policies and practices (Internet Society, 2015, 2016).

Alarming reports of hacked IoT devices have appeared in the popular press. Reports have surfaced of wireless baby monitors—as well as medical devices such as hospital lab blood gas analyzers, radiology picture archive and communication systems, drug infusion pumps, and hospital x-ray systems—being hacked. The previously mentioned DDoS attack on Dyn launched by the Mirai botnet relied in part on more than 500,000 IoT devices such as Internet-connected security cameras. Attention has also recently been focused on hacks and security flaws involving Internet-connected devices such as Amazon's Ring doorbell camera and Google's Nest camera, smart TVs, smart speakers, and even smart lightbulbs and coffee machines (Srinivas, 2020).

TABLE 5.4 INTERNET OF THINGS SECURITY CHALLENGES

CHALLENGE	POSSIBLE IMPLICATIONS
Many IoT devices, such as sensors, are intended to be deployed on a much greater scale than are traditional Internet-connected devices, creating a vast quantity of interconnected links that can be exploited.	Existing tools, methods, and strategies need to be developed to deal with this unprecedented scale.
Many instances of IoT consist of collections of identical devices that all have the same characteristics.	Magnifies the potential impact of a security vulnerability.
Many IoT devices are anticipated to have a much longer service life than typical equipment has.	Devices may "outlive" the manufacturer, leaving them without long-term support, which creates persistent vulnerabilities.
Many IoT devices are intentionally designed without the ability to be upgraded or the upgrade process is difficult.	Raises the possibility that vulnerable devices cannot or will not be fixed, leaving them perpetually vulnerable.
Many IoT devices do not provide the user with visibility into the workings of the device or into the data being produced, and do not alert the user when a security problem arises.	Users may believe an IoT device is functioning as intended when, in fact, it may be performing in a malicious manner.
Some IoT devices, such as sensors, are unobtrusively embedded in the environment such that a user may not even be aware of the device.	Security breaches might persist for a long time before being noticed.

METAVERSE SECURITY ISSUES

Malware is also likely to be targeted at the 3-D virtual reality environment known as the metaverse as the metaverse develops further. The hardware needed for virtual reality and augmented reality platforms will create new endpoints that hackers will seek to exploit. Attackers could potentially manipulate platforms to create physical dangers. Participants in the metaverse may also be subject to various forms of harassment by malicious actors. Identities can be stolen, as can digital currencies that are used to pay for goods and services. All of the security issues currently being experienced with today's Internet are likely to continue to persist in the metaverse.

The privacy of participants and the security of their personal information are also concerns. These issues are particularly acute because metaverse companies may track and retain user biometric data, as well as data about users' actual actions, and ultimately may be able to learn how users uniquely think and act.

5.3 TECHNOLOGY SOLUTIONS

At first glance, it might seem like there is not much that can be done about the onslaught of security breaches on the Internet. Reviewing the security threats in the previous section, it is clear that the threats to e-commerce are very real; widespread; global; potentially devastating for individuals, businesses, and entire nations; and likely to be increasing in intensity along with the growth in e-commerce and the continued expansion of the Internet. But in fact, a great deal of progress has been made by private security firms, corporate and home users, network administrators, technology firms, and government agencies. There are two lines of defense: technology solutions and policy solutions. In this section, we consider some technology solutions, and in the following section, we look at some policy solutions.

The first line of defense against the wide variety of e-commerce security threats is a set of tools that can make it difficult for outsiders to attack a site. **Figure 5.3** illustrates the major tools available to achieve e-commerce security.

PROTECTING INTERNET COMMUNICATIONS

Because e-commerce transactions must flow over the public Internet and, therefore, involve thousands of routers and servers through which the transaction packets flow, security experts believe the greatest security threats occur at the level of Internet communications. This is very different from a private network, where a dedicated communication line is established between two parties. A number of tools are available to protect the security of Internet communications, the most basic of which is message encryption.

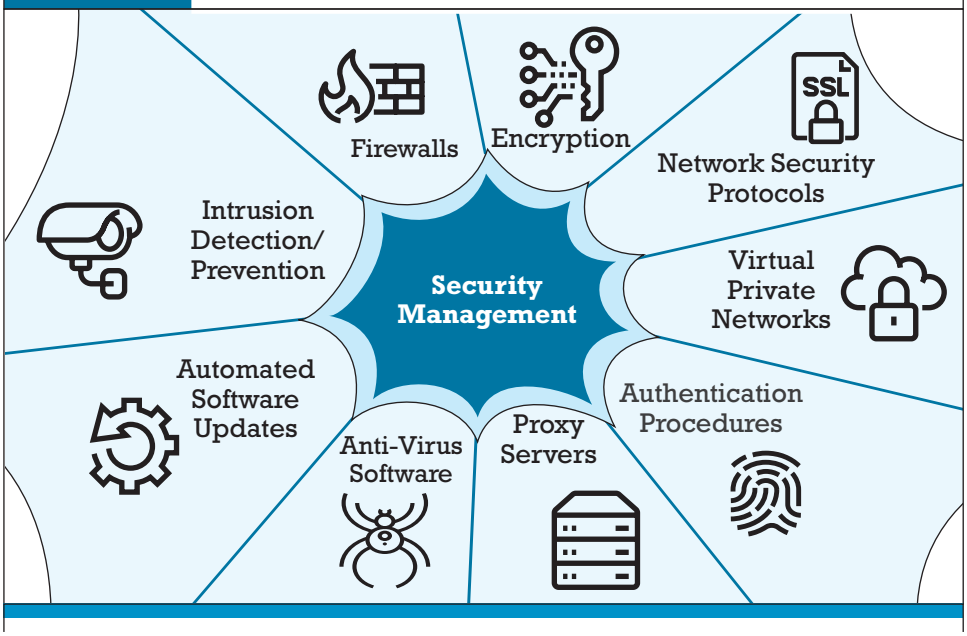
encryption
the process of transforming plain text or data into cipher text that cannot be read by anyone other than the sender and the receiver

cipher text
text that has been encrypted and thus cannot be read by anyone other than the sender and the receiver

ENCRYPTION

Encryption is the process of transforming plain text or data into **cipher text** that cannot be read by anyone other than the sender and the receiver. The purposes of encryption are (1) to secure stored information and (2) to secure information transmission.

FIGURE 5.3 TOOLS AVAILABLE TO ACHIEVE E-COMMERCE SECURITY



There are a number of tools available to achieve e-commerce security.

Encryption can provide four of the six key dimensions of e-commerce security referred to in Table 5.2:

- *Message integrity*—provides assurance that the message has not been altered.
- *Nonrepudiation*—prevents the user from denying that the user sent the message.
- *Authentication*—provides verification of the identity of the person (or computer) sending the message.
- *Confidentiality*—gives assurance that the message was not read by others.

key (cipher)
any method for transforming plain text to cipher text

substitution cipher
every occurrence of a given letter is replaced systematically by another letter

transposition cipher
the ordering of the letters in each word is changed in some systematic way

This transformation of plain text to cipher text is accomplished by using a key or cipher. A **key (or cipher)** is any method for transforming plain text to cipher text.

Encryption has been practiced since the earliest forms of writing and commercial transactions. Ancient Egyptian and Phoenician commercial records were encrypted using substitution and transposition ciphers. In a **substitution cipher**, every occurrence of a given letter is replaced systematically by another letter. For instance, if we used the cipher "letter plus two"—meaning "Replace every letter in a word with a new letter two places forward"—then the word "Hello" in plain text would be transformed into the following cipher text: "JGNNQ." In a **transposition cipher**, the ordering of the letters in each word is changed in some systematic way. Leonardo Da Vinci recorded his shop notes in reverse order, making them readable only with a mirror. The word "Hello" can be written backward as "OLLEH." A more complicated cipher would (1) break all words into two words and (2) spell the first word with every other letter, beginning with the first letter, and then spell the second word with all the remaining letters. In this cipher, "HELLO" would be written as "HLO EL."

Symmetric Key Cryptography

In order to decipher (decrypt) these messages, the receiver would have to know the secret cipher that was used to encrypt the plain text. This is called **symmetric key cryptography** or **secret key cryptography**. In symmetric key cryptography, both the sender and the receiver use the same key to encrypt and decrypt the message. How do the sender and the receiver have the same key? They have to send it over some communication media or exchange the key in person. Symmetric key cryptography was used extensively throughout World War II and is still a part of Internet cryptography.

symmetric key cryptography (secret key cryptography) both the sender and the receiver use the same key to encrypt and decrypt the message

The possibilities for simple substitution and transposition ciphers are endless, but they all suffer from common flaws. First, in the digital age, computers are so powerful and fast that these ancient means of encryption can be broken quickly. Second, symmetric key cryptography requires that both parties share the same key. To share the same key, they must send the key over a presumably *insecure* medium, where it could be stolen and used to decipher messages. If the secret key is lost or stolen, the entire encryption system fails. Third, in commercial use, where we are not all part of the same team, you would need a secret key for each of the parties with whom you transacted—that is, one key for the bank, another for the department store, and another for the government. In a large population of users, this could result in as many as $n(n-1)$ keys. In a population of millions of Internet users, thousands of millions of keys would be needed to accommodate all e-commerce customers (estimated at about 215 million in the United States). Potentially, 215^2 million different keys would be needed. Clearly, this situation would be too unwieldy to work in practice.

Modern encryption systems are digital: The ciphers or keys used to transform plain text into cipher text are digital strings. Computers store text or other data as binary strings composed of 0s and 1s. For instance, the binary representation of the capital letter "A" in ASCII computer code is accomplished with eight binary digits (bits): 01000001. One way in which digital strings can be transformed into cipher text is by multiplying each letter by another binary number, say, an eight-bit key number such as 0101 0101. If we multiplied every digital character in our text messages by this eight-bit key and sent the encrypted message to a friend along with the secret eight-bit key, the friend could decode the message easily.

The strength of modern security protection is measured in terms of the length of the binary key used to encrypt the data. In the preceding example, the eight-bit key is easily deciphered because there are only 28 or 256 possibilities. If the intruder knows you are using an eight-bit key, then they could decode the message in a few seconds using a modern desktop PC just by using the brute force method of checking each of the 256 possible keys. For this reason, modern digital encryption systems use keys with 56, 128, 256, or 512 binary digits. With encryption keys of 512 digits, there are 2,512 possibilities to check out. It is estimated that all the computers in the world would need to work for 10 years before stumbling upon the answer.

Data Encryption Standard (DES) developed by the National Security Agency (NSA) and IBM. Uses a 56-bit encryption key

Advanced Encryption Standard (AES) the most widely used symmetric key algorithm, offering 128-, 192-, and 256-bit keys

The **Data Encryption Standard (DES)** was developed by the National Security Agency (NSA) and IBM in the 1950s. DES uses a 56-bit encryption key. To cope with much faster computers, it has been improved by the *Triple DES Encryption Algorithm (TDEA)*—essentially encrypting the message three times, each with a separate key. Today, the most widely used symmetric key algorithm is **Advanced Encryption Standard (AES)**, which offers key sizes of 128, 192, and 256 bits. AES had been considered to be relatively

secure, but in 2011, researchers from Microsoft and a Belgian university announced that they had discovered a way to break the algorithm, and with this work, the "safety margin" of AES continues to erode. There are also many other symmetric key systems that are currently less widely used, with keys up to 2,048 bits.[1]

Public Key Cryptography

public key cryptography two mathematically related digital keys are used: a public key and a private key. The private key is kept secret by the owner, and the public key is widely disseminated. Both keys can be used to encrypt and decrypt a message. However, once the keys are used to encrypt a message, that same key cannot be used to unencrypt the message

In 1976, a new way of encrypting messages called **public key cryptography** was invented by Whitfield Diffie and Martin Hellman. Public key cryptography (also referred to as *asymmetric cryptography*) solves the problem of exchanging keys. In this method, two mathematically related digital keys are used: a public key and a private key. The private key is kept secret by the owner, and the public key is widely disseminated. Both keys can be used to encrypt and decrypt a message. However, once the keys are used to encrypt a message, the same key cannot be used to unencrypt the message. The mathematical algorithms used to produce the keys are one-way functions. A *one-way, irreversible mathematical function* is one in which, once the algorithm is applied, the input cannot be subsequently derived from the output. Most food recipes are like this. For instance, it is easy to make scrambled eggs but impossible to retrieve whole eggs from the scrambled eggs. Public key cryptography is based on the idea of irreversible mathematical functions. The keys are sufficiently long (128, 256, and 512 bits) that it would take enormous computing power to derive one key from the other using the largest and fastest computers available. **Figure 5.4** illustrates a simple use of public key cryptography and takes you through the important steps in using public and private keys.

Public Key Cryptography Using Digital Signatures and Hash Digests

In public key cryptography, some elements of security are missing. Although we can be quite sure the message was not understood or read by a third party (message confidentiality), there is no guarantee that the sender really is the sender—that is, there is no authentication of the sender. This means the sender could deny ever sending the message (repudiation). And there is no assurance that the message was not altered somehow in transit. For example, the message "Buy Cisco @ $16" could have been accidentally or intentionally altered to read "Sell Cisco @ $16." This suggests a potential lack of integrity in the system.

A more sophisticated use of public key cryptography can achieve authentication, nonrepudiation, and integrity. **Figure 5.5** on page 272 illustrates this more powerful approach.

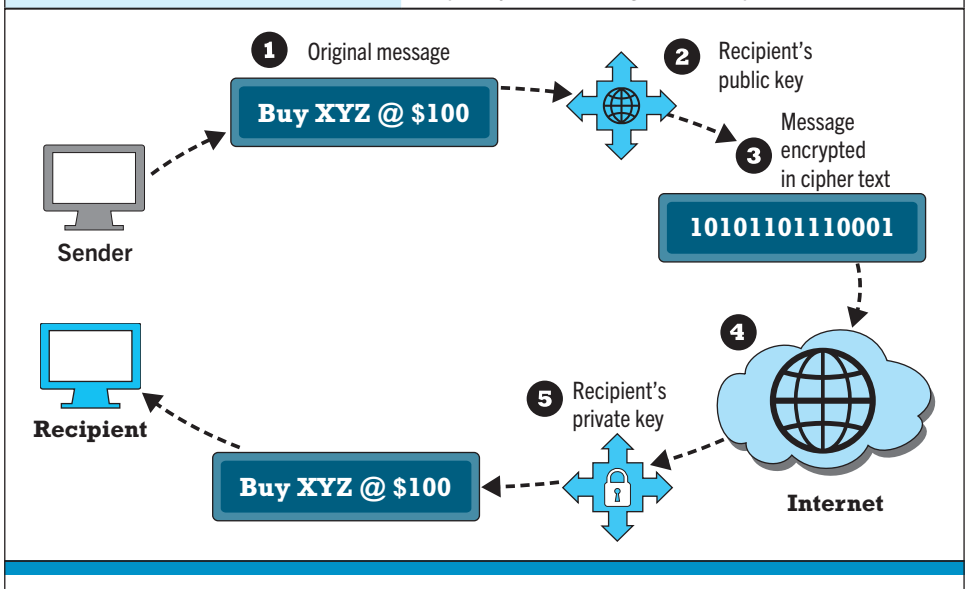
hash function an algorithm that produces a fixed-length number called a hash or message digest

To check the integrity of a message and ensure it has not been altered in transit, a hash function is first used to create a digest of the message. A **hash function** is an algorithm that produces a fixed-length number called a *hash or message digest*. A hash function can be simple and count just the number of digital 1s in a message, or it can be more complex and produce a 128-bit number that reflects the number of 0s and 1s, the number of 00s and 11s, and so on. Standard hash functions are available (MD4 and MD5 produce 128- and 160-bit hashes, respectively) (Stein, 1998). These more complex hash functions produce hashes or hash results that are unique to every message. The results of applying the hash function are sent by the sender to the recipient. Upon receipt, the

[1]For instance: DESX, GDES, and RDES with 168-bit keys; the RC Series: RC2, RC4, and RC5 with keys up to 2,048 bits; and the IDEA algorithm, the basis of PGP, e-mail public key encryption software described later in this chapter, which uses 128-bit keys.

FIGURE 5.4 PUBLIC KEY CRYPTOGRAPHY—A SIMPLE CASE

STEP	DESCRIPTION
1. The sender creates a digital message.	The message could be a document, spreadsheet, or any digital object.
2. The sender obtains the recipient's public key from a public directory and applies it to the message.	Public keys are distributed widely and can be obtained from recipients directly.
3. Application of the recipient's key produces an encrypted cipher text message.	Once encrypted using the public key, the message cannot be reverse-engineered, or unencrypted, using the same public key. The process is irreversible.
4. The encrypted message is sent over the Internet.	The encrypted message is broken into packets and sent through several different pathways, making interception of the entire message difficult (but not impossible).
5. The recipient uses the recipient's private key to decrypt the message.	The only person who can decrypt the message is the person who has possession of the recipient's private key. Hopefully, this is the legitimate recipient.



In the simplest use of public key cryptography, the sender encrypts a message using the recipient's public key and then sends it over the Internet. The only person who can decrypt this message is the recipient, using the recipient's private key. However, this simple case does not ensure integrity or an authentic message.

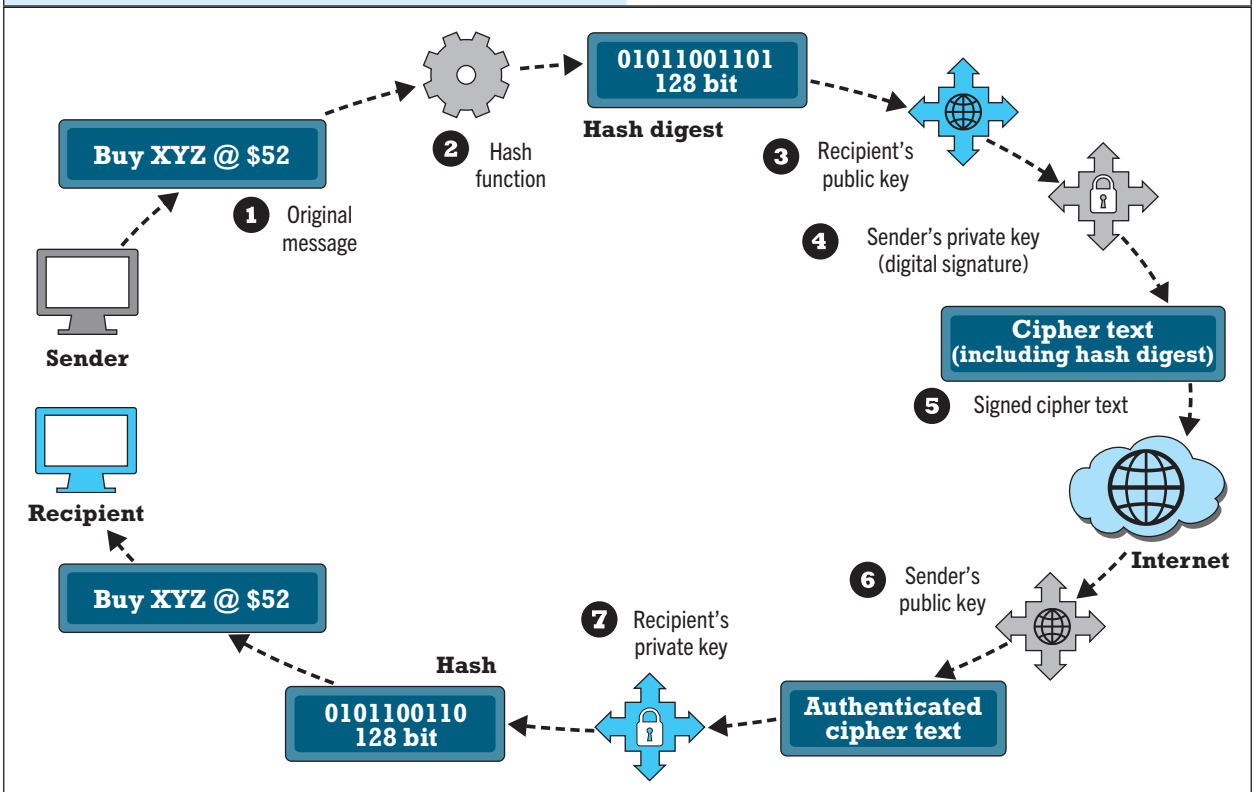
recipient applies the hash function to the received message and checks to verify that the same result is produced. If so, the message has not been altered. The sender then encrypts both the hash result and the original message using the recipient's public key (as in Figure 5.4), producing a single block of cipher text.

One more step is required. To ensure the authenticity of the message and to ensure nonrepudiation, the sender encrypts the entire block of cipher text one more time using the sender's private key. This produces a **digital signature** (also called an *e-signature*) or "signed" cipher text that can be sent over the Internet.

digital signature (e-signature) "signed" cipher text that can be sent over the Internet

FIGURE 5.5 PUBLIC KEY CRYPTOGRAPHY WITH DIGITAL SIGNATURES

STEP	DESCRIPTION
1. The sender creates an original message.	The message can be any digital file.
2. The sender applies a hash function, producing a 128-bit hash result.	Hash functions create a unique digest of the message based on the message contents.
3. The sender encrypts the message and hash result using the recipient's public key.	This irreversible process creates a cipher text that can be read only by the recipient using the recipient's private key.
4. The sender encrypts the result, again using the sender's private key.	The sender's private key is a digital signature. There is only one person who can create this digital mark.
5. The result of this double encryption is sent over the Internet.	The message traverses the Internet as a series of independent packets.
6. The receiver uses the sender's public key to authenticate the message.	Only one person, namely, the sender, can send this message.
7. The receiver uses the receiver's private key to decrypt the hash function and the original message. The receiver checks to ensure that the original message and the hash function results conform to one another.	The hash function is used here to check the original message. This ensures that the message was not changed in transit.



A more realistic use of public key cryptography uses hash functions and digital signatures both to ensure the confidentiality of the message and to authenticate the sender. The only person who could have sent this message is the sender using the sender's private key. This authenticates the message. The hash function ensures that the message was not altered in transit. As before, the only person who can decipher the message is the recipient, using the recipient's private key.

A digital signature is a close parallel to a handwritten signature. Like a handwritten signature, a digital signature is unique—only one person presumably possesses the private key. When used with a hash function, the digital signature is even more unique than a handwritten signature. In addition to being exclusive to a particular individual, when used to sign a hashed document, the digital signature is also unique to the document and changes for every document.

The recipient of this signed cipher text first uses the sender's public key to authenticate the message. Once authenticated, the recipient uses the recipient's private key to obtain the hash result and original message. As a final step, the recipient applies the same hash function to the original text and compares the result with the result sent by the sender. If the results are the same, the recipient knows the message has not been changed during transmission. The message thus has integrity.

Early digital signature programs required the user to have a digital certificate and were far too difficult for an individual to use. Newer programs are Internet-based and do not require users to install software or understand digital certificate technology. DocuSign, Adobe Sign, and Sertifi are among a number of companies offering online digital signature solutions. Many insurance, finance, and surety companies now permit customers to electronically sign documents.

Digital Certificates and Public Key Infrastructure (PKI)

There are still some deficiencies in the message security regime described previously. How do we know that people and institutions are who they claim to be? Anyone can make up a private and public key combination and claim to be someone they are not. Before you place an order with an online merchant such as Amazon, you want to be sure it really is Amazon that you have on the screen and not a spoofer masquerading as Amazon. In the physical world, if someone asks who you are and you show a social security number, they may well ask to see a picture ID or a second form of certifiable or acceptable identification. If they really doubt who you are, they may ask for references to other authorities and actually interview these other authorities. Similarly, in the digital world, we need a way to know who people and institutions really are.

Digital certificates, and the supporting public key infrastructure, are an attempt to solve this problem of digital identity. A **digital certificate** is a digital document issued by a trusted third-party institution known as a **certification authority (CA)** that contains the name of the subject or company, the subject's public key, a digital certificate serial number, an expiration date, an issuance date, the digital signature of the certification authority (the name of the CA encrypted using the CA's private key), and other identifying information (see **Figure 5.6**).

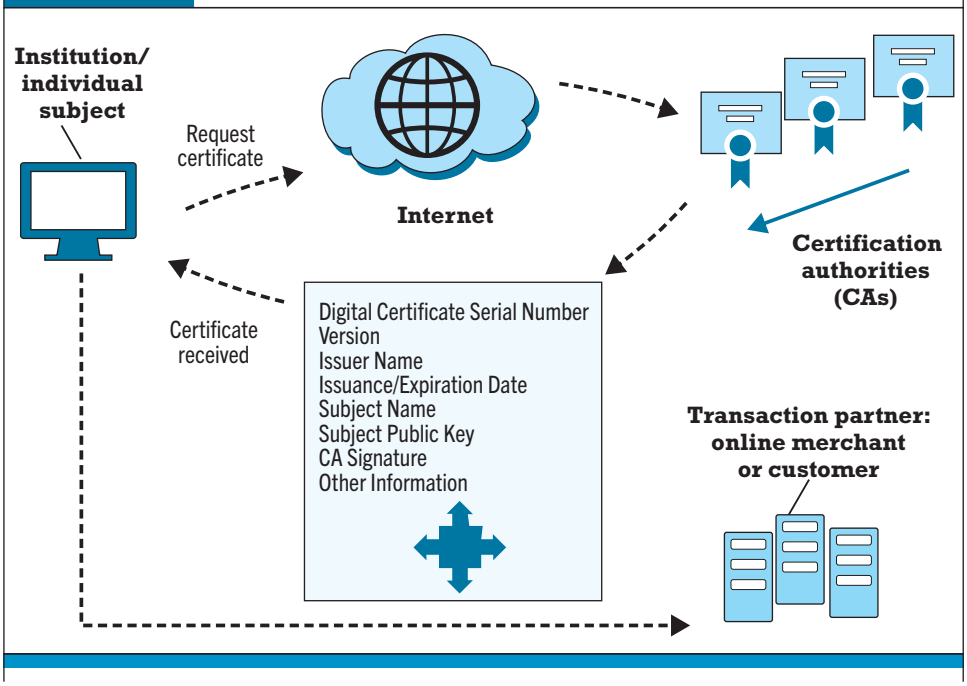
In the United States, private corporations such as VeriSign, browser manufacturers, security firms, and government agencies such as the U.S. Postal Service and the Federal Reserve issue CAs. Worldwide, thousands of organizations issue CAs. A hierarchy of CAs has emerged with less well-known CAs being certified by larger and better-known CAs, creating a community of mutually verifying institutions. **Public key infrastructure (PKI)** refers to the CAs and digital certificate procedures that are accepted by all parties. When you sign into a "secure" site, the URL will begin with "https", and a closed lock icon will appear on your browser. This means the site has a digital certificate issued by a trusted CA. It is not, presumably, a spoof site.

digital certificate
a digital document issued by a certification authority that contains a variety of identifying information

certification authority (CA)
a trusted third party that issues digital certificates

public key infrastructure (PKI)
CAs and digital certificate procedures that are accepted by all parties

FIGURE 5.6 DIGITAL CERTIFICATES AND CERTIFICATION AUTHORITIES



The PKI includes certification authorities that issue, verify, and guarantee digital certificates that are used in e-commerce to ensure the identity of transaction partners.

To create a digital certificate, the user generates a public/private key pair and sends a request for certification to a CA along with the user's public key. The CA verifies the information (how this is accomplished differs from CA to CA). The CA issues a certificate containing the user's public key and other related information. Finally, the CA creates a message digest from the certificate itself (just like a hash digest) and signs it with the CA's private key. This signed digest is called the *signed certificate*. We end up with a totally unique cipher text document—there can be only one signed certificate like this in the world.

There are several ways the certificates are used in commerce. Before initiating a transaction, the customer can request the signed digital certificate of the merchant and decrypt it using the merchant's public key to obtain both the message digest and the certificate as issued. If the message digest matches the certificate, then the merchant and the public key are authenticated. The merchant may in return request certification of the user, in which case the user would send the merchant the user's individual certificate. There are many types of certificates: personal, institutional, web server, software publisher, and CAs themselves.

PKI and CAs can also be used to secure software code and content for applications that are directly downloaded to mobile devices from the Internet. Using a technique referred to as code signing, mobile application developers use their private key to encrypt a digital signature. When end users decrypt the signature with the corresponding public key, it confirms the developer's identity and the integrity of the code.

Limitations of PKI

PKI is a powerful technological solution to security issues, but it has many limitations, especially concerning CAs. PKI applies mainly to protecting messages in transit on the Internet and is not effective against insiders—employees—who have legitimate access to corporate systems, including customer information. Most e-commerce companies do not store customer information in encrypted form. Other limitations are apparent. For one, how is your private key to be protected? Most private keys will be stored on insecure desktop or laptop computers.

There is also no guarantee that the person using your computer—and your private key—is really you. For instance, you may lose your laptop or smartphone and, therefore, lose the private key. Likewise, there is no assurance that someone else in the world cannot use your personal ID papers, such as a social security card, to obtain a PKI authenticated online ID in your name. If there's no real-world identification system, there can be no truly secure Internet identification system. Under many digital signature laws, you are responsible for whatever your private key does even if you were not the person using the key. This is very different from mail-order or telephone order credit card rules, where you have a right to dispute the credit card charge. Second, there is no guarantee that the verifying computer of the merchant is secure. Third, CAs are self-selected organizations seeking to gain access to the business of authorization. They may not be authorities on the corporations or individuals they certify. For instance, how can a CA know about all the corporations within an industry to determine who is or is not legitimate? A related question concerns the method used by the CA to identify the certificate holder: Was this an e-mail transaction verified only by claims of the applicants who filled out an online form? Digital certificates have been hijacked by hackers, tricking consumers into giving up personal information Last, what are the policies for revoking or renewing certificates? The expected life of a digital certificate or private key is a function of the frequency of use and the vulnerability of the systems that use the certificate. Yet most CAs have no policy or just an annual policy for re-issuing certificates. If Microsoft, Apple, or Cisco ever rescinded a number of CAs, millions of users would not be able to access sites. The CA system is thus difficult and costly to police.

SECURING CHANNELS OF COMMUNICATION

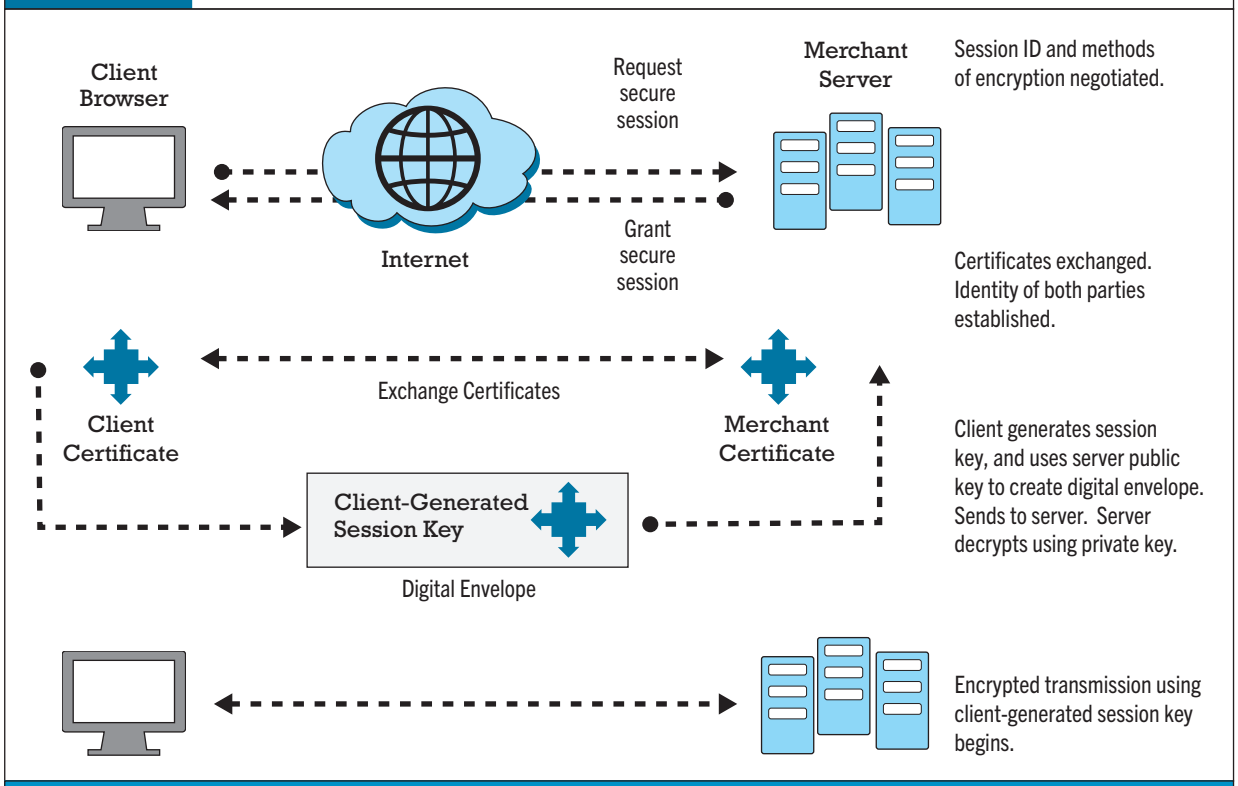
The concepts of public key cryptography are used routinely for securing channels of communication.

Transport Layer Security (TLS) and HTTPS

Secure Sockets Layer (SSL) was the original protocol enabling secure communications over the Internet. Today, however, it has been replaced by the *Transport Layer Security (TLS)* protocol, which is an updated, more secure version of SSL. When you receive a message from a server on the Web with which you will be communicating through a secure channel, this means you will be using TLS to establish a secure negotiated session. (Notice that the URL changes from HTTP to HTTPS.) A **secure negotiated session** is a client-server session in which the URL of the requested document, along with the contents, contents of forms, and the cookies exchanged, are encrypted (see **Figure 5.7**). For instance, your credit card number that you entered into a form would be encrypted.

secure negotiated session
a client-server session in which the URL of the requested document, along with the contents, contents of forms, and the cookies exchanged, are encrypted

FIGURE 5.7 SECURE NEGOTIATED SESSIONS USING TLS



Certificates play a key role in using TLS to establish a secure communications channel.

session key
a unique symmetric encryption key chosen for a single secure session

Through a series of handshakes and communications, the browser and the server establish one another's identity by exchanging digital certificates, decide on the strongest shared form of encryption, and then proceed to communicate using an agreed-upon session key. A **session key** is a unique symmetric encryption key chosen just for this single secure session. Once used, it is gone forever. Figure 5.7 shows how this works.

In practice, most private individuals do not have a digital certificate. In this case, the merchant server will not request a certificate, but the client browser will request the merchant certificate once a secure session is called for by the server.

TLS provides data encryption, server authentication, optional client authentication, and message integrity for TCP/IP connections. TLS addresses the issue of authenticity by allowing users to verify another user's identity or the identity of a server. It also protects the integrity of the messages exchanged. However, once the merchant receives the encrypted credit and order information, that information is typically stored in unencrypted format on the merchant's servers. While TLS provides secure transactions between merchant and consumer, it guarantees only server-side authentication. Client authentication is optional. In addition, TLS cannot provide

irrefutability—consumers can order goods or download information products and then claim the transaction never occurred. The most current version of TLS is version 1.3, released in 2018. In 2020, most major browsers removed support for the older, TLS 1.0 and TLS 1.1 versions.

TLS is used in conjunction with **HTTPS**, a secure version of the HTTP protocol that uses TLS for encryption and authentication. It is implemented by a server adopting the HTTP Strict Transport Security (HSTS) feature, which forces browsers to access the server using only HTTPS. Today, about 80% of websites now use HTTPS as their default protocol (W3techs.com, 2022).

HTTPS
secure version of the HTTP protocol that uses TLS for encryption and authentication

Virtual Private Network (VPNs)

A **virtual private network (VPN)** allows remote users to securely access a local area network via the Internet, using a variety of VPN protocols. VPNs use both authentication and encryption to secure information from unauthorized persons (thus providing confidentiality and integrity). Authentication prevents spoofing and misrepresentation of identities. A remote user can connect to a remote private local network using a local ISP. The VPN protocols will establish the link from the client to the corporate network as if the user had dialed into the corporate network directly. The process of connecting one protocol through another (IP) is called *tunneling* because the VPN creates a private connection by adding an invisible wrapper around a message to hide its content. As the message travels through the Internet between the ISP and the corporate network, it is shielded from prying eyes by an encrypted wrapper.

virtual private network (VPN)
allows remote users to securely access internal networks via the Internet, using the Point-to-Point Tunneling Protocol (PPTP)

A VPN is "virtual" in the sense that it appears to users as a dedicated secure line when, in fact, it is a temporary secure line. The primary use of VPNs is to establish secure communications between various parties, such as a business and its suppliers, or a business and its employees working remotely. A dedicated connection to a business partner can be very expensive. However, using the Internet and VPN as the connection method significantly reduces the cost of secure communications. The use of VPNs has skyrocketed as a result of the tremendous increase in the number of people working remotely (AtlasVPN, 2022).

Wireless (Wi-Fi) Networks

Accessing the Internet via a wireless (Wi-Fi) network has its own particular security issues. Early Wi-Fi networks used a security standard called Wired Equivalent Privacy (WEP) to encrypt information. WEP was very weak and easy for hackers to crack. An alternative standard, Wi-Fi Protected Access (WPA), was developed that provided a higher standard of protection, but this, too, soon became vulnerable to intrusion. **WPA2**, introduced in 2004, uses the AES algorithm for encryption and CCMP, a more advanced authentication code protocol. In 2018, the Wi-Fi Alliance, the trade group that oversees the WPA protocol, announced the next generation of the protocol, **WPA3**, which implements a more robust key exchange protocol and a more secure way to connect IoT devices. It also features expanded encryption for public networks. However, even the updated WPA3 standard has vulnerabilities that could allow attackers to recover passwords (Kan, 2019; Barrett, 2018).

WPA2
wireless security standard that uses the AES algorithm for encryption and CCMP, a more advanced authentication code protocol

WPA3
next-generation WPA protocol that implements more robust security

PROTECTING NETWORKS

Once you have protected communications as well as possible, the next set of tools to consider are those that can protect your networks as well as the servers and clients on those networks.

Firewalls

Firewalls and proxy servers are intended to build a wall around your network and the attached servers and clients, just like physical-world firewalls protect you from fires for a limited period of time. Firewalls and proxy servers have some similar functions, but they are quite different.

firewall
refers to either hardware or software that filters communication packets and prevents some packets from entering the network based on a security policy

A **firewall** refers to either hardware or software that filters communication packets and prevents some packets from entering or exiting the network based on a security policy. The firewall controls traffic to and from servers and clients, forbidding communications from untrustworthy sources and allowing communications from trusted sources to proceed. Every message that is to be sent or received from the network is processed by the firewall, which determines whether the message meets security guidelines established by the business. If it does, it is permitted to be distributed, and if it doesn't, the message is blocked. Firewalls can filter traffic based on packet attributes such as source IP address, destination port or IP address, type of service (such as WWW or HTTP), the domain name of the source, and many other attributes. Most hardware firewalls that protect local area networks connected to the Internet have default settings that require little if any administrator intervention and employ simple but effective rules that deny incoming packets from a connection that does not originate from an internal request—the firewall allows connections only from servers that you requested service from. A common default setting on hardware firewalls (DSL and cable modem routers) simply ignores efforts to communicate with TCP port 445, the most commonly attacked port. The increasing use of firewalls by home and business Internet users has greatly reduced the effectiveness of attacks and forced hackers to focus more on e-mail attachments to distribute worms and viruses.

There are two major methods that firewalls use to validate traffic: packet filters and application gateways. *Packet filters* examine data packets to determine whether they are destined for a prohibited port or originate from a prohibited IP address (as specified by the security administrator). The filter specifically looks at the source and destination information, as well as the port and packet type, when determining whether the information may be transmitted. One downside of the packet filtering method is that it is susceptible to spoofing because authentication is not one of its roles.

Application gateways are a type of firewall that filters communications based on the application being requested rather than the source or destination of the message. Such firewalls also process requests at the application level, which is farther away from the client computer than where packet filters process requests. By providing a central filtering point, application gateways provide greater security than packet filters but can compromise system performance.

Next-generation firewalls use an application-centric approach to firewall control. They are able to identify applications regardless of the port, protocol, or security evasion tools used; identify users regardless of device or IP address; decrypt outbound TLS traffic; and protect in real time against threats embedded in applications.

Proxy Servers

Proxy servers (proxies) are software servers (often a dedicated computer) that handle all communications originating from or being sent to the Internet by local clients, acting as a bodyguard for the organization. Proxies act primarily to limit access of internal clients to external Internet servers, although some proxy servers act as firewalls as well. Proxy servers are sometimes called *dual-home systems* because they have two network interfaces. To internal computers, a proxy server is known as the *gateway*, while to external computers it is known as a *mail server* or *numeric address*.

proxy server (proxy) software server that handles all communications originating from or being sent to the Internet, acting as a bodyguard for the organization

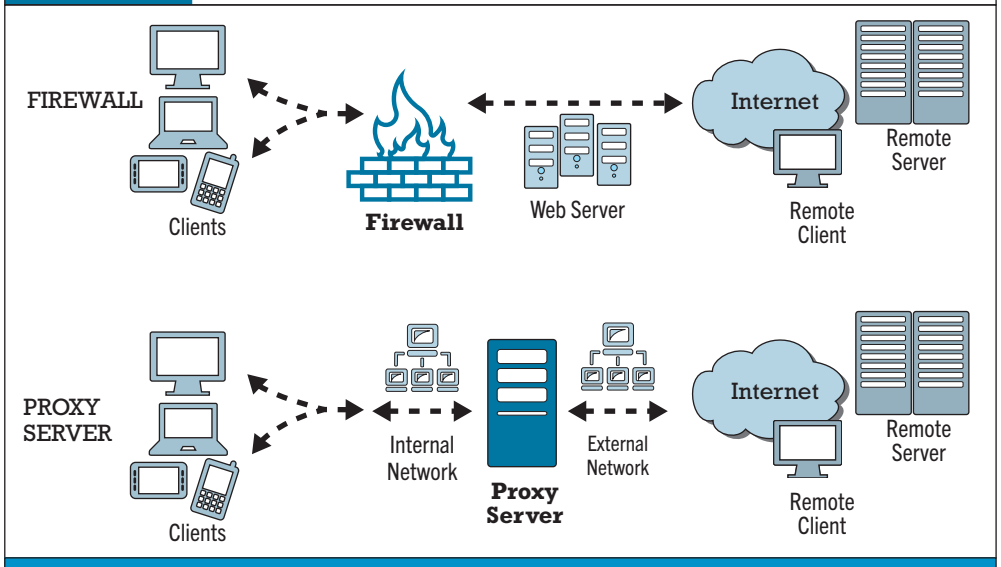
When a user requests a web page on an internal network, the request is routed first to the proxy server. The proxy server validates the user and the nature of the request and then sends the request onto the Internet. A web page sent by an external Internet server first passes to the proxy server. If acceptable, the web page passes onto the internal network web server and then to the client desktop. By prohibiting users from communicating directly with the Internet, companies can restrict access to certain types of sites, such as pornographic, auction, or stock-trading sites. Proxy servers also improve web performance by storing frequently requested web pages locally, thus reducing upload times, and hiding the internal network's address, making it more difficult for hackers to monitor. **Figure 5.8** illustrates how firewalls and proxy servers protect a local area network from Internet intruders and prevent internal clients from reaching prohibited web servers.

Intrusion Detection and Prevention Systems

In addition to a firewall and a proxy server, an intrusion detection and/or prevention system can be installed. An **intrusion detection system (IDS)** examines network

intrusion detection system (IDS) examines network traffic, watching to see if it matches certain patterns or preconfigured rules indicative of an attack

FIGURE 5.8 FIREWALLS AND PROXY SERVERS



The primary function of a firewall is to deny access to local computers by remote client computers. The primary purpose of a proxy server is to provide controlled access from local computers to remote computers.

intrusion prevention system (IPS)
has all the functionality of an IDS, with the additional ability to take steps to prevent and block suspicious activities

traffic, watching to see if it matches certain patterns or preconfigured rules indicative of an attack. If it detects suspicious activity, the IDS will set off an alarm, alerting administrators, and log the event in a database. An IDS is useful for detecting malicious activity that a firewall might miss. An **intrusion prevention system (IPS)** has all the functionality of an IDS, with the additional ability to take steps to prevent and block suspicious activities. For instance, an IPS can terminate a session and reset a connection, block traffic from a suspicious IP address, or reconfigure firewall or router security controls.

PROTECTING SERVERS AND CLIENTS

Operating system features and anti-virus software can help further protect servers and clients from certain types of attacks.

Operating System and Application Software Security Enhancements

The most obvious way to protect servers and clients is to take advantage of automatic computer security upgrades. The Microsoft, Apple, and Linux/Unix operating systems are continuously updated to patch vulnerabilities discovered by hackers. These patches are autonomic—that is, when using these operating systems on the Internet, you are prompted and informed that operating system enhancements are available. Users can easily download these security patches for free. The most common forms of malware can be prevented by simply keeping your server and client operating systems and applications up to date. Application vulnerabilities are fixed in the same manner. For instance, most popular Internet browsers are updated automatically, with little user intervention needed. However, although automated software updates are a critical method of protecting users, they are not totally foolproof. In recent years, as discussed in the opening case, what is known as a **software supply chain attack**, in which hackers target development environments to infect software that is then downloaded by end users, has increased in frequency

software supply chain attack
hackers target development environments to infect software that is then downloaded by end users

Anti-Virus Software

The easiest and least expensive way to prevent threats to system integrity is to install anti-virus software. Programs by Malwarebytes, McAfee, Norton AntiVirus, and many others provide inexpensive tools to identify and eradicate the most common types of malicious code as they enter a computer as well as to destroy those already lurking on a hard drive. Anti-virus programs can be set up so that e-mail attachments are inspected before you click on them, and the attachments are eliminated if they contain a known virus or worm. It is not enough, however, to simply install the software once. Because new viruses are developed and released every day, daily, routine updates are needed in order to prevent new threats from being loaded. Some premium-level anti-virus software is updated hourly.

Anti-virus suite packages and stand-alone programs are available to eliminate intruders such as bot programs, adware, and other security risks. Such programs work much like anti-virus software in that they look for recognized hacker tools or signature actions of known intruders.

5.4 MANAGEMENT POLICIES, BUSINESS PROCEDURES, AND PUBLIC LAWS

Worldwide, in 2022, companies are expected to spend about $300 billion on security hardware, software, and services, up about 15% from the previous year (Braue, 2021). However, most CEOs and CIOs believe that technology is not the sole answer to managing e-commerce security risks. The technology provides a foundation, but in the absence of intelligent management policies, even the best technology can be easily defeated. Public laws and active enforcement of cybercrime statutes also are required to both raise the costs of illegal behavior on the Internet and guard against corporate abuse of information. Let's consider briefly the development of management policies.

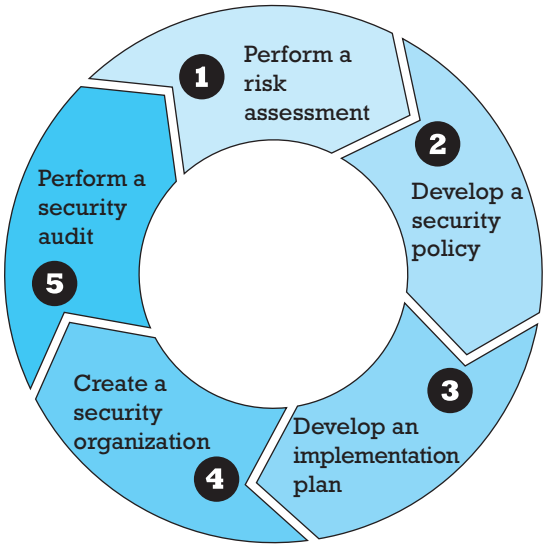
A SECURITY PLAN: MANAGEMENT POLICIES

In order to minimize security threats, e-commerce firms must develop a coherent policy that takes into account the nature of the risks, the information assets that need protecting, and the procedures and technologies required to address the risks, as well as implementation and auditing mechanisms. **Figure 5.9** illustrates the key steps in developing a solid security plan.

A security plan begins with **risk assessment**—an assessment of the risks and points of vulnerability. The first step is to inventory the information and knowledge assets of the e-commerce site and company. What information is at risk? Is it customer

risk assessment
an assessment of the risks and points of vulnerability

FIGURE 5.9 DEVELOPING AN E-COMMERCE SECURITY PLAN



There are five steps involved in developing an e-commerce security plan.

information, proprietary designs, business activities, secret processes, or other internal information such as price schedules, executive compensation, or payroll? For each type of information asset, try to estimate the dollar value to the firm if this information were compromised, and then multiply that amount by the probability of the loss occurring. Once you have done so, rank-order the results. You now have a list of information assets prioritized by their value to the firm.

security policy
a set of statements prioritizing the information risks, identifying acceptable risk targets, and identifying the mechanisms for achieving these targets

Based on your quantified list of risks, you can start to develop a **security policy**—a set of statements prioritizing the information risks, identifying acceptable risk targets, and identifying the mechanisms for achieving these targets. You will obviously want to start with the information assets that you determined to be the highest priority in your risk assessment. Who generates and controls this information in the firm? What existing security policies are in place to protect the information? What enhancements can you recommend to improve the security of these most valuable assets? What level of risk are you willing to accept for each of these assets? Are you willing, for instance, to lose customer credit card data once every 10 years? Or will you pursue a 100-year hurricane strategy by building a security edifice for credit card data that can withstand the once-in-100-year disaster? You will need to estimate how much it will cost to achieve this level of acceptable risk. Remember: Total and complete security may require extraordinary financial resources. By answering these questions, you will have the beginnings of a security policy.

implementation plan
the steps you will take to achieve the security plan goals

Next, consider an **implementation plan**—the steps you will take to achieve the security plan goals. Specifically, you must determine how you will translate the levels of acceptable risk into a set of tools, technologies, policies, and procedures. What new technologies will you deploy to achieve the goals, and what new employee procedures will be needed?

security organization
educates and trains users, keeps management aware of security threats and breakdowns, and maintains the tools chosen to implement security

To implement your plan, you will need an organizational unit in charge of security and a security officer—someone who is in charge of security on a daily basis. For a small e-commerce site, the security officer will likely be the person in charge of Internet services or the site manager, whereas for larger firms, there typically is a dedicated team with a supporting budget. The **security organization** educates and trains users, keeps management aware of security threats and breakdowns, and maintains the tools chosen to implement security.

access controls
determine who can gain legitimate access to a network

authentication procedures
include the use of digital signatures, certificates of authority, public key infrastructure, and multi-factor authentication tools

The security organization typically administers access controls, authentication procedures, and authorization policies. **Access controls** determine which outsiders and insiders can gain legitimate access to your networks. Outsider access controls include firewalls and proxy servers, while insider access controls typically consist of login procedures (usernames, passwords, and access codes). *Zero trust* (*ZT*) is a popular cybersecurity framework based on the principle of maintaining strict access controls and by default not trusting anyone or anything, even those behind a corporate firewall (Gerritz, 2020).

multi-factor authentication (MFA) tools
require users to have multiple credentials to verify their identity

two-factor authentication (2FA)
subset of MFA that requires two credentials

Authentication procedures include the use of digital signatures, certificates of authority, PKI, and **multi-factor authentication (MFA) tools** that require users to have multiple credentials to verify their identify. Authentication credentials might include something the user knows, such as a password; something the user possesses, such as a smartphone or YUBIkey USB device; and something that the user "is," such as a physical characteristic. **Two-factor authentication (2FA)** is a subset of MFA that requires two credentials. Many MFA systems use mobile phones and involve either texting a one-time

dynamic secure passcode to the phone or pushing an authentication request to an app on the phone that the user can confirm via a built-in biometric authenticator, such as Touch ID, as further discussed next. However, MFA tools can still be compromised by malware such as Trickbot, which can intercept the one-time codes sent by an app; by phishing attacks; as well as by other methods (Allison, 2020; Wolff, 2019).

Biometric devices can also be used to verify physical attributes associated with an individual, such as a facial, fingerprint, or retina (eye) scan or speech recognition system, and are often part of a multi-factor authentication system. (**Biometrics** is the study of measurable biological, or physical, characteristics.) A company could require, for example, that an individual undergo a fingerprint scan before being allowed access to a website or before being allowed to pay for merchandise with a credit card. Biometric devices make it even more difficult for hackers to break into websites or facilities, significantly reducing the opportunity for spoofing. Newer Apple iPhones (5S and later) feature a fingerprint sensor called Touch ID built into the iPhone's home button that can unlock the phone and authorize purchases without requiring users to enter a PIN or other security code. The system does not store an actual fingerprint but, rather, biometric data, which is encrypted and stored only on a chip within the iPhone and is not made available to third parties. In 2017, Apple introduced Face ID, a facial recognition system that enables users to log on to the phone using a facial scan. Using the system is optional, and as with Touch ID, the data comprising the scan is stored only on the chip within the phone and not in the cloud. Nonetheless, the system has raised a slew of security and privacy issues. See the *Insight on Business* case, *Are Biometrics the Solution for E-commerce Security?*, for a further examination of biometrics.

biometrics
the study of measurable biological or physical characteristics

Security tokens are physical devices or software that generate an identifier that can be used in addition to or in place of a password. Security tokens are used by millions of corporation and government workers to log on to corporate clients and servers. One example is RSA's SecurID token, which continuously generates six-digit passwords.

security token
physical device or software that generates an identifier that can be used in addition to or in place of a password

Authorization policies determine differing levels of access to information assets for differing levels of users. **Authorization management systems** establish where and when a user is permitted to access certain parts of a website. Their primary function is to restrict access to private information within a company's Internet infrastructure. Although there are several authorization management products currently available, most operate in the same way. The system encrypts a user session to function like a passkey that follows the user from page to page, allowing access only to those areas that the user is permitted to enter, based on information set at the system database. By establishing entry rules up front for each user, the authorization management system knows who is permitted to go where at all times.

authorization policies
determine differing levels of access to information assets for differing levels of users

authorization management system
establishes where and when a user is permitted to access certain parts of a website

The last step in developing an e-commerce security plan is performing a security audit. A **security audit** involves the routine review of access logs (identifying how outsiders are using the site as well as how insiders are accessing the site's assets). A monthly report should be produced that establishes the routine and nonroutine accesses to the systems and identifies unusual patterns of activities. As previously noted, ethical hackers are often used by large companies to evaluate the strength of their existing security procedures. Many small firms have sprung up in the last five years to provide these services.

security audit
involves the routine review of access logs (identifying how outsiders are using the site as well as how insiders are accessing the site's assets)

INSIGHT ON BUSINESS

ARE BIOMETRICS THE SOLUTION FOR E-COMMERCE SECURITY?

As e-commerce continues to grow and constitute an increasing share of overall commerce, cybercriminals have followed suit. Even consumers that take necessary precautions online are susceptible to identity theft and other forms of cybercrime. Malicious actors have honed techniques for bypassing traditional techniques of online verification, including stealing credit card numbers, PIN numbers, and answers to security questions. However, biometric security promises to revolutionize the way users verify themselves, potentially rendering many of the methods used by today's identity thieves obsolete.

Biometrics involves identifying individuals based on physiological characteristics that are unique to each person. These characteristics include fingerprints, the shape of each person's face, and the patterns within the irises of each person's eyes as well as other methods such as voice recognition, analysis of heart rhythms, and even analysis of vein patterns in the palm. Whereas traditional credit card systems use physical tokens such as credit cards in tandem with private knowledge such as passwords, PIN numbers, and security questions, biometric systems use physical attributes to verify identities, which are in theory much more difficult for criminals to spoof. You can forget a password, but you can't forget your face. E-commerce companies are excited about the potential of biometrics, which could also reduce the number of abandoned shopping carts due to forgotten passwords by as much as 70%. The use of biometrics to authenticate mobile payment transactions is expected to skyrocket, with Juniper Research predicting an increase from $332 billion in 2022 to $1.2 trillion by 2027, as biometric authentication supplants traditional password-based methods as the most common method of facilitating payments.

The ideas behind biometric technologies have been around for a while, but it's only recently that widely available technology such as smartphones has become advanced enough to offer them. Not surprisingly, Apple is the leader in this area, first offering Touch ID fingerprint verification on older generations of iPhones, and later unveiling its Face ID capability with the launch of the iPhone X. Face ID uses an advanced camera to create a 3-D model of the user's face with 30,000 invisible dots. This model is then encrypted and is stored locally—it's never uploaded online, further protecting it from thieves. Face ID has replaced Touch ID as Apple's preferred method to unlock its phones and make payments, and Apple claims that its false-positive rate is approximately one in a million, a significant improvement from Touch ID's 1 in 50,000. Face ID is now also available on the iPad Pro.

Other smartphone manufacturers are doing their best catch up to Apple. Samsung introduced a feature called Intelligent Scan for its Galaxy S9 and S9+ phones, which combines iris and facial scanning in one system. Samsung replaced the Intelligent Scan system in its S10 and S20 smartphones with a system simply called Facial Recognition. In contrast to Apple's Face ID, both Samsung systems employ a simple 2-D camera for facial recognition, which is less secure than Face ID.

Credit card companies and various banks are also working on their own biometric solutions. In 2019, Mastercard rolled out a feature

it calls Mastercard Identity Check, also known informally as Selfie Pay—users simply take a quick selfie to confirm their identities when making credit card transactions. In May 2022, building on its previous efforts, Mastercard launched a new Biometric Checkout Program, which it characterizes as a first-of-its-kind technology framework outlining a set of standards that banks, merchants, and technology providers can adhere to in order to ensure the security and privacy of personal data when people pay biometrically. The European Union's Payment Services Directive 2 requires banks to provide strong customer authentication with at least two of three elements: something the customer knows (password or PIN), something the customer has (phone or hardware token), and something the customer is (fingerprint or facial recognition).

Cybercriminals will undoubtedly be working hard to overcome the additional challenges posed by biometrics. The stakes are particularly high with biometrics because a stolen password can easily be changed, but you can't easily change your face, fingerprint, or iris. Researchers have claimed to be able to unlock iPhones with Face ID using masks, and although duplicating this technique is unlikely to be cost-effective, it does demonstrate proof of concept. Biometrics ensure only that the person attempting to use a service is the same person that signed up for that service; a trusted authority is still required to confirm identities when users sign up for various services. There are also privacy concerns that accompany facial recognition and other biometric technologies. In the EU, facial recognition images may not be used to investigate a citizen's private life, but some countries such as China, where smartphone manufacturers Huawei, ZTE, and OnePlus were found to be secretly transmitting their Chinese users' data to the government, may abuse the technology for surveillance. Legal precedent is also mixed on whether law enforcement can compel users to unlock their phones using biometric information, whereas it is clear that users cannot be compelled to provide their passwords for more traditionally protected devices.

An emerging approach that may overcome some of these limitations to biometrics is behavioral biometrics, which measures and analyzes human activity patterns to generate a unique profile for each user. Systems using behavioral biometrics analyze patterns in keystrokes (including speed, key pressure, and finger positioning) along with geographic information such as IP address and geolocation. Once a profile is formed for a user, sufficiently large deviations from that profile trigger a warning. Companies like BioCatch are offering behavioral biometrics solutions that allow retailers and banks to create these types of profiles for their users and accurately detect instances of fraud. Behavioral biometrics do little to quell fears about the erosion of privacy, however. Smartphone users will simply have to determine whether the considerable benefits of biometrics outweigh the similarly significant privacy concerns.

SOURCES: "Behavioral Biometrics," Biocatch.com, July 20, 2022; "Biometrically Authenticated Remote Mobile Payments to Reach $1.2 Trillion Globally by 2027," Juniperresearch.com, May 30, 2022; "With a Smile or a Wave, Paying in Store Just Got Personal," Mastercard.com, May 17, 2022; "About Face ID Advanced Technology," Support.apple.com, April 27, 2022; "How the Quirky Ways You Type, Swipe, and Behave Can Protect You," by Emily Bary, Marketwatch.com, October 2, 2021; "PSD2: Strong Customer Authentication," Stripe.com, May 12, 2021; "Galaxy S10: Ten Features to Enable and Disable," by Adam Ismail, Tomsguide.com, March 28, 2019; "Mastercard Identity Check: Bringing Consumers a Better Digital Experience," by Chris Reid, Newsroom.mastercard.com, January 10, 2019.

THE ROLE OF LAWS AND PUBLIC POLICY

The public policy environment today is very different from what it was in the early days of e-commerce. Today, the Internet is no longer an ungoverned, unsupervised, self-controlled technology juggernaut. Just as with financial markets over the last 70 years, there is a growing awareness that e-commerce markets work only when a powerful institutional set of laws and enforcement mechanisms are in place. These laws help ensure orderly, rational, and fair markets. This growing public policy environment is becoming just as global as e-commerce itself. Despite some spectacular, internationally based attacks on U.S. e-commerce companies, the sources and persons involved in major harmful attacks have almost always been uncovered and, when possible, prosecuted.

Voluntary and private efforts have played a very large role in identifying criminal hackers and assisting law enforcement. Since 1995, as e-commerce has grown in significance, national and local law enforcement activities have expanded greatly. New laws have been passed that grant national, state, and local governments new tools and mechanisms for identifying, tracing, and prosecuting cybercriminals. For instance, a majority of states now require companies that maintain personal data on their residents to publicly disclose when a security breach affecting those residents has occurred, and a number of states also require organizations to implement data security practices when handling personal information. For instance, New York's SHIELD Act establishes minimum security requirements for both for-profit and non-for-profit businesses that store such information (Brumfield, 2020). **Table 5.5** lists the most significant federal e-commerce security legislation and regulation. In addition, the Federal Trade Commission (FTC) has asserted that it has authority over corporations' data security practices. Between 2002 and 2021, the FTC brought 80 cases against companies with respect to their data security practices (Federal Trade Commission, 2021).

After September 11, 2001, Congress passed the Patriot Act, which broadly expanded law enforcement's investigative and surveillance powers. The Act has provisions for monitoring e-mail and Internet use. The Homeland Security Act also attempts to fight cyberterrorism and increases the government's ability to compel information disclosure by computer and ISP sources. In 2015, the Cybersecurity Information Sharing Act (CISA) was signed into law. CISA creates a system that lets companies share evidence about attacks without the risk of being sued for doing so.

Private and Private-Public Cooperation Efforts

United States Computer Emergency Readiness Team (US-CERT)
division of the U.S. Department of Homeland Security that coordinates cyber incident warnings and responses across government and private sectors

The good news is that e-commerce companies are not alone in their battle to achieve security on the Internet. A number of organizations—some public and some private—are devoted to tracking down criminal organizations and individuals engaged in attacks against Internet and e-commerce companies. On the federal level, the Office of Cybersecurity and Communications (CS&C) within the U.S. Department of Homeland Security (DHS) is responsible for overseeing the security, resilience, and reliability of the United States' cyber and communications infrastructure. The National Cybersecurity and Communications Integration Center (NCCIC) acts as a 24/7 cyber monitoring, incident response, and management center. In addition, the DHS operates the **United States Computer Emergency Readiness Team (US-CERT)**, which coordinates cyber incident warnings and responses across both the government and the private sectors. One of

TABLE 5.5 E-COMMERCE SECURITY LEGISLATION AND REGULATION

LEGISLATION/REGULATION	SIGNIFICANCE
Computer Fraud and Abuse Act (CFAA)	Primary federal statute used to combat computer crime, including hacking.
Electronic Communications Privacy Act (ECPA)	Imposes fines and imprisonment for individuals who access, intercept, or disclose the private e-mail communications of others.
National Information Infrastructure Protection Act (NIIPA)	Makes DoS attacks illegal; creates National Infrastructure Protection Center (NIPC).
Health Insurance Portability and Accountability Act (HIPAA)	Requires certain health care facilities to report data breaches.
Financial Services Modernization Act (Gramm-Leach-Bliley Act)	Requires certain financial institutions to report data breaches.
Cyberspace Electronic Security Act (CESA)	Reduces export restrictions.
Computer Security Enhancement Act (CSEA)	Protects federal government systems from hacking.
Electronic Signatures in Global and National Commerce Act (the "E-Sign Law")	Authorizes the use of electronic signatures in legal documents.
Patriot Act	Authorizes use of computer-based surveillance of suspected terrorists.
Homeland Security Act (HSA)	Authorizes establishment of the Department of Homeland Security (DHS), which is responsible for developing a comprehensive national plan for security of the key resources and critical infrastructures of the United States; DHS becomes the central coordinator for all cyberspace security efforts.
CAN-SPAM Act	Although primarily a mechanism for civil and regulatory lawsuits against spammers, the CAN-SPAM Act also creates several new criminal offenses intended to address situations in which the perpetrator has taken steps to hide their identity or the source of the spam from recipients, ISPs, or law enforcement agencies. Also contains criminal sanctions for sending sexually explicit e-mail without designating it as such.
U.S. SAFE WEB Act	Enhances FTC's ability to obtain monetary redress for consumers in cases involving spyware, spam, Internet fraud, and deception; also improves FTC's ability to gather information and coordinate investigations with foreign counterparts.
Improving Critical Infrastructure Cybersecurity Executive Order	Executive order that directs federal agencies to share cybersecurity threat intelligence with private-sector companies that may be targets and to develop and implement a cybersecurity framework for private industry, incorporating best practices and voluntary standards.
Cybersharing Information Sharing Act (CISA)	Encourages businesses and the federal government to share cyber threat information in the interests of national security.

CERT Coordination Center
monitors and tracks online criminal activity reported to it by private corporations and government agencies that seek out its help

the better-known private organizations is the **CERT Coordination Center** (formerly known as the Computer Emergency Response Team) at Carnegie Mellon University. CERT monitors and tracks online criminal activity reported to it by private corporations and government agencies that seek out its help. CERT is composed of full-time and part-time computer experts who can trace the origins of attacks against sites despite the complexity of the Internet. Its staff members also assist organizations in identifying security problems, developing solutions, and communicating with the public about widespread hacker threats. The CERT Coordination Center also provides product assessments, reports, and training in order to improve the public's knowledge and understanding of security threats and solutions.

5.5 E-COMMERCE PAYMENT SYSTEMS

For the most part, existing payment mechanisms such as cash, credit cards, debit cards, checking accounts, and stored value accounts have been able to be adapted to the online environment, albeit with some significant limitations that have led to efforts to develop alternatives. In addition, new types of purchasing relationships, such as among individuals online, and new technologies, such as the development of the mobile platform, have also created both a need and an opportunity for the development of new payment systems. In this section, we provide an overview of the major e-commerce payment systems in use today. **Table 5.6** lists some of the major trends in e-commerce payments in 2022–2023.

U.S. online payments represent a market of more than $1 trillion in 2022. The volume of online payments surged because of the Covid-19 pandemic, and many experts predict that this trend will continue even after the pandemic has passed. Institutions and business firms that can handle this volume of transactions (mostly the large banking and credit card firms) generally extract 2%–3% of the transactions in the form of fees, or about $20–$30 billion a year in revenue. Given the size of the market, competition for online payments is spirited. New forms of online payment are expected to attract a substantial part of this growth.

TABLE 5.6 MAJOR TRENDS IN E-COMMERCE PAYMENTS 2022–2023

- Payment by credit and/or debit card remains the dominant form of online payment.
- Online payment volume surges because of the Covid-19 pandemic.
- Mobile retail adoption and payment volume skyrockets.
- PayPal remains the most popular alternative payment method online.
- Apple, Google, and Samsung extend their reach in mobile payment apps.
- Growing convergence in the online payments marketplace: Large banks enter the mobile wallet and P2P payments market with apps such as Zelle, while Apple introduces a credit card.
- Mobile P2P payment systems such as Venmo, Zelle, and Square Cash take off. Most mobile wallets also offer P2P payments.
- Buy Now Pay Later (BNPL) payment services increase in popularity.
- Interest in cryptocurrencies such as Bitcoin surges, even as prices crash and concerns about security increase.

In the United States, the primary form of online payment is still the existing credit and debit card system. According to a Federal Reserve survey, debit and credit cards are still the most preferred payment methods (Cubides and O'Brien, 2022). Alternative payment systems include desktop and mobile apps for payments to retail stores, online merchants, vendors, and P2P payments. Nearly all alternative payment systems rely on traditional bank and credit card institutions to store funds and provide credit. Providers of alternative payment systems are often involved in both online desktop payment systems as well as mobile wallet apps. For instance, in the United States, PayPal is the most widely used app for online payment for e-commerce transactions and also offers a mobile wallet app for payment to vendors and P2P payments. Mobile wallet apps are the fastest-growing form of alternative payment systems, with an estimated 41% of U.S. smartphone users (around 100 million people) making use of such apps in 2022 (Insider Intelligence/eMarketer, 2022a) worldwide.

ONLINE CREDIT CARD TRANSACTIONS

Because credit and debit cards are the dominant form of online payment, it is important to understand how they work and to recognize the strengths and weaknesses of this payment system. Online credit card transactions are processed in much the same way that in-store credit card purchases are, with the major differences being that online merchants never see the actual card being used, no card impression is taken, and no signature is available. Online credit card transactions most closely resemble Mail Order-Telephone Order (MOTO) transactions. These types of purchases are also called Cardholder Not Present (CNP) transactions and are the major reason that charges can be disputed later by consumers. Because the merchant never sees the credit card or receives a signed agreement from the customer to pay, when disputes arise, the merchant faces the risk that the transaction may be disallowed and reversed even though the merchant has already shipped the goods or the customer has already downloaded the digital product.

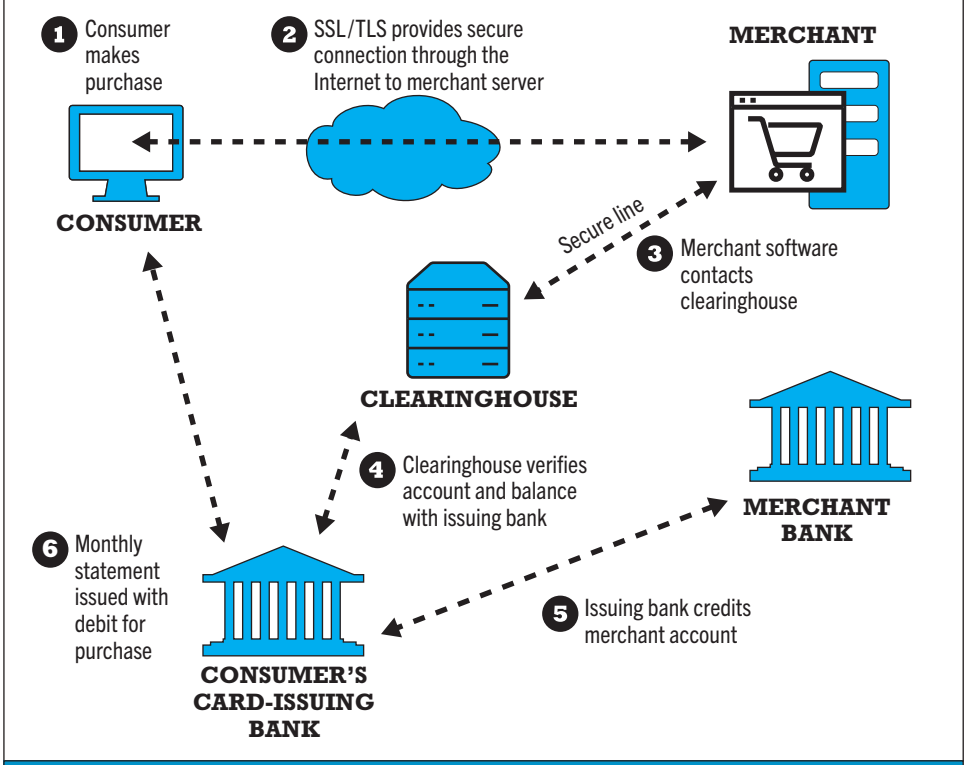
Figure 5.10 illustrates the online credit card purchasing cycle. There are five parties involved in an online credit card purchase: consumer, merchant, clearinghouse, merchant bank (sometimes called the "acquiring bank"), and the consumer's card-issuing bank. In order to accept payments by credit card, online merchants must have a merchant account established with a bank or financial institution. A **merchant account** is simply a bank account that allows companies to process credit card payments and receive funds from those transactions.

merchant account
a bank account that allows companies to process credit card payments and receive funds from those transactions

As shown in Figure 5.10, an online credit card transaction begins with a purchase (1). When a consumer wants to make a purchase, the consumer adds the item to the merchant's shopping cart. When the consumer wants to pay for the items in the shopping cart, a secure tunnel through the Internet is created using TLS. Using encryption, TLS secures the session during which credit card information will be sent to the merchant and protects the information from being used by interlopers on the Internet (2). TSL does not authenticate either the merchant or the consumer. The transacting parties have to trust one another.

Once the consumer credit card information is received by the merchant, the merchant software contacts a clearinghouse (3). As previously noted, a clearinghouse is a financial intermediary that authenticates credit cards and verifies account balances.

FIGURE 5.10 HOW AN ONLINE CREDIT CARD TRANSACTION WORKS



The clearinghouse contacts the issuing bank to verify the account information (4). Once verified, the issuing bank credits the account of the merchant at the merchant's bank (usually this occurs at night in a batch process) (5). The debit to the consumer account is transmitted to the consumer in a monthly statement (6).

Credit Card E-commerce Enablers

Companies that have a merchant account still need to buy or build a means of handling the online transaction; securing the merchant account is only the first step in a two-step process. Today, Internet payment service providers (sometimes referred to as payment gateways) can provide both a merchant account and the software tools needed to process credit card purchases online.

For instance, Authorize.net is an online payment service provider. The company helps a merchant secure an account with one of Authorize.net's merchant account provider partners and then provides payment processing software for installation on the merchant's server. The software collects the transaction information from the merchant's site and then routes it via the Authorize.net "payment gateway" to the appropriate bank, ensuring that customers are authorized to make their purchases. The funds for the transaction are then transferred to the merchant's merchant account. Other online payment service providers include Cybersource, Stripe, and Square.

PCI-DSS Compliance

The **PCI-DSS (Payment Card Industry-Data Security Standard)** is a data security standard instituted by the five major credit card companies (Visa, Mastercard, American Express, Discover, and JCB). PCI-DSS is not a law or governmental regulation but is instead an industry-mandated standard. Every online merchant must comply with the appropriate level of PCI-DSS in order to accept credit card payments. Those that fail to comply and are involved in a credit card breach may ultimately be subjected to fines and other expenses. PCI-DSS has various levels, each related to the number of credit and/or debit cards processed by the merchant each year (PCI Security Standards Council, 2019).

PCI-DSS (Payment Card Industry-Data Security Standards) data security standards instituted by the five major credit card companies

Limitations of Online Credit Card Payment Systems

There are a number of limitations to the existing credit card payment system. The most important limitations involve security, merchant risk, administrative and transaction costs, and social equity.

The existing system offers poor security. Neither the merchant nor the consumer can be fully authenticated. The merchant could be a criminal organization designed to collect credit card numbers, and the consumer could be a thief using stolen or fraudulent cards. The risk facing merchants is high. Consumers can repudiate charges even though the goods have been shipped or the product downloaded. As you learned earlier in the chapter, credit card companies have introduced EMV cards (cards with a computer chip) to reduce credit card fraud. The chip stores account data and generates a unique transaction code for each use. The use of EMV cards has significantly reduced credit card fraud for in-store purchases (known as card-present [CP] fraud). But criminals have intensified their focus on card-not-present (CNP) fraud, which comprises an ever-increasing share of the losses due to credit card fraud (Mullen, 2021).

The administrative costs for merchants of setting up an online credit card system and becoming authorized to accept credit cards are high. Transaction costs for merchants also are significant—roughly 3% of the purchase plus a transaction fee of 20–35 cents per transaction, plus other setup fees.

Credit cards are also not very democratic even though they seem ubiquitous. Millions of young adults do not have credit cards, along with almost 100 million other adult Americans who cannot afford cards or who are considered poor risks because of their low incomes.

ALTERNATIVE ONLINE PAYMENT SYSTEMS

The limitations of the online credit card system have opened the way for the development of a number of alternative online payment systems. Chief among them is PayPal. PayPal enables individuals and businesses with e-mail accounts to make and receive payments up to a specified limit. Paypal is an example of an **online stored value payment system**, which permits consumers to make online payments to merchants and other individuals using their bank account or credit/debit cards. It is available in more than 200 countries around the world. PayPal builds on the existing financial infrastructure of the countries in which it operates: You establish a PayPal account by specifying a credit, debit, or checking account that you wish to have charged or paid when conducting online transactions. When you make a payment using PayPal, you e-mail the

online stored value payment system permits consumers to make instant, online payments to merchants and other individuals based on the value stored in an online account

payment to the merchant's PayPal account. PayPal then transfers the amount from your credit or checking account to the merchant's bank account. The beauty of PayPal is that no personal credit information has to be shared among the users and that the service can be used by individuals to pay one another even in small amounts. However, one problem with PayPal is its relatively high cost. For example, when using a credit card as the source of funds to send or request money, the cost ranges from 1.9% to 3.49% of the amount (depending on the type of transaction), plus a small, fixed fee (typically $0.49) per transaction. However, PayPal continues to dominate the alternative payment landscape with more than 425 million active consumer users and 34 million active merchant accounts as of 2022 (PayPal Holdings, Inc., 2022).

Although PayPal is by far the most well-known and commonly used online credit/debit card alternative, there are a number of other alternatives. Amazon Pay is aimed at consumers who have concerns about entrusting their credit card information to unfamiliar online retailers. Consumers can purchase goods and services at non-Amazon websites using the payment methods stored in their Amazon accounts and without having to re-enter their payment information at the merchant's site. Amazon provides the payment processing. Meta Pay (formerly Facebook Pay) is a service that lets users transfer money directly from their banks and credit cards to make purchases from merchants and to send and receive money. Users enter their preferred payment method, and then Meta saves the information for future transactions. Visa Checkout and Mastercard's MasterPass substitute a user's name and password for an actual payment card number during online checkout. Both MasterPass and Visa Checkout are supported by a number of large payment processors and online retailers. However, they have not yet achieved PayPal's level of usage.

Buy Now Pay Later (BNPL) services platforms that allow consumers to purchase a product and pay for it in installments

Buy Now Pay Later (BNPL) services are platforms that allow consumers to purchase a product and pay for it in installments. BNPL payment volume has increased from just $6.5 billion in 2019, when such services were first being introduced, to more than $75 billion in 2022. Almost 80 million people in the United States use BNPL services. Popular providers include Klarna, with around 35 million users, and Afterpay, with around 20 million (Insider Intelligence/eMarketer, 2022b).

MOBILE PAYMENT SYSTEMS: YOUR SMARTPHONE WALLET

Mobile payment systems are one of the fastest-growing types of alternative payments. The use of mobile devices as payment mechanisms is already well established in Asia and many countries in Europe, such as Denmark, Norway, Italy, and the Netherlands, and is increasing in the United States, where the infrastructure to support mobile payment is now in place. Mobile payments involve any type of payment using a mobile device, including bill pay, online purchases, in-store purchases, and P2P payments. Mobile wallets (sometimes also referred to as digital wallets) are smartphone apps that store debit cards, reward coupons, invoices, vouchers, and other means of payment that might be found in a traditional wallet.

universal proximity mobile wallets can be used at a variety of merchants for point-of-sale transactions

branded store proximity mobile wallets can be used only at a single merchant

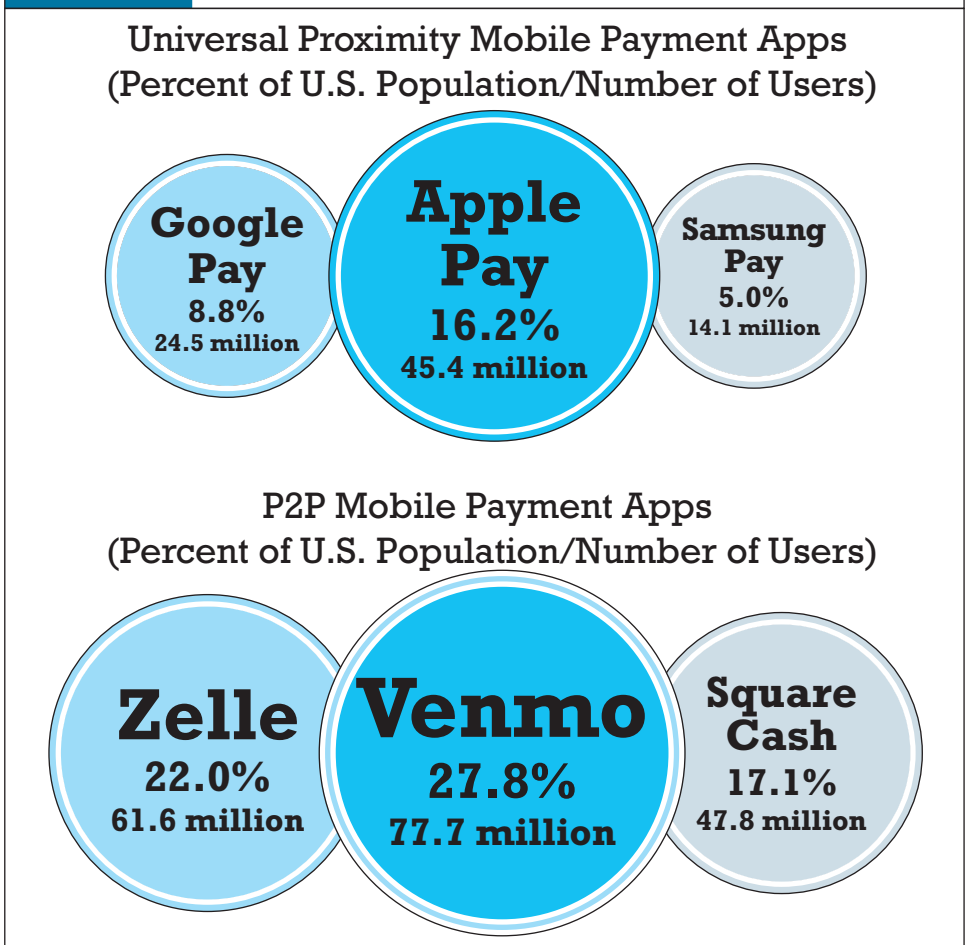
There are three primary types of mobile wallet apps: universal proximity wallets, branded store proximity wallets, and P2P apps. **Universal proximity mobile wallets**, such as Apple Pay, Google Pay, and Samsung Pay, which can be used at a variety of merchants for point-of-sale transactions if the merchant supports that service (e.g., has an Apple merchant app and can accept such payments), are the most-well-known and common type. **Branded store proximity mobile wallets** are mobile apps that can be used

only at a single merchant. For instance, Walmart, Target, Starbucks, and Dunkin' all have very successful mobile wallet apps. In the United States in 2022, around 100 million people use universal and branded proximity mobile apps (Insider Intelligence/eMarketer, 2022a). **P2P mobile payment apps**, such as Venmo, Zelle, and Square Cash, are used for payments among individuals who have the same app. About 150 million people in the United States use such apps in 2022 (Insider Intelligence/eMarketer, 2022c). **Figure 5.11** illustrates the market penetration and number of users of the leading universal proximity mobile wallet apps and P2P mobile payment apps.

P2P mobile payment apps
used for payments among individuals

In the United States, mobile proximity apps (both universal and branded store) are expected to be used to process about $415 billion in payments in 2022, up more than

FIGURE 5.11 MOBILE WALLET APP ADOPTION



Apple Pay is, by far and away, the leading universal proximity mobile payment app in terms of both the percentage of universal mobile payment app users and the total number of users. Venmo is the leading P2P mobile payment app.
SOURCES: Based on data from Insider Intelligence/eMarketer, 2022a, 2022c.

40% from 2021. The U.S. P2P mobile payment app transaction value is expected to be even higher, reaching almost $1.1 trillion in 2022 (Insider Intelligence/eMarketer, 2022a, 2022c).

Mobile payments continue to be the fastest-growing form of payments but constitute only a tiny portion of overall U.S. payments market, which is comprised of credit card, debit card, automated billing (called ACH payments), and check payments (Federal Reserve System, 2021). Consumers remain comfortable with using credit and debit cards, although branded in-store payment apps at national retailers like Starbucks, Walmart, and Target have been very successful and are growing more rapidly in terms of adopters and especially actual usage in stores than have Apple Pay, Google Pay, and Samsung Pay. In P2P payments, the leaders are Venmo (owned by PayPal), Zelle (offered by nearly 10,000 U.S. financial institutions), and Square Cash (owned by Square, which pioneered the Square Reader, a device that enables anyone with a smartphone or tablet to be able to accept card payments) (Insider Intelligence/eMarketer, 2022c; Zelle, 2022). For a closer look at mobile payments, see the case study *Mobile Payments: Fintech versus the Bank Giants*, at the end of the chapter.

near field communication (NFC) a set of short-range wireless technologies used to share information among devices

Quick Response (QR) code technology uses a mobile app to generate a two-dimensional code that the merchant scans and that enables the payment amount to be deducted from the customer's mobile wallet

Near field communication (NFC) is the primary enabling technology for universal proximity mobile wallets, while QR code technology is typically used for branded store proximity mobile wallets. **Near field communication (NFC)** is a set of short-range wireless technologies used to share information among devices within about two inches (50 mm) of each other. NFC devices are either powered or passive. A connection requires one powered device (the initiator, such as a smartphone) and one target device, such as a merchant NFC reader, that can respond to requests from the initiator. NFC targets can be very simple forms such as tags, stickers, key fobs, or readers. NFC peer-to-peer communication is possible when both devices are powered. Consumers can swipe their NFC-equipped phone near a merchant's reader to pay for purchases. Apple Pay and Google Pay both require NFC, while Samsung Pay uses both NFC and magnetic secure transmission technology similar to that used on the magnetic strip on credit cards. **Quick Response (QR) code technology** uses a mobile app to generate a two-dimensional bar code (the QR code) in which information is encoded. The merchant then scans the QR code, and the payment amount is deducted from the customer's mobile wallet, which is linked to a credit card or debit card. Walmart Pay, Starbucks Pay, Target Pay, Dunkin', and many other retailers all use QR-based technologies.

BLOCKCHAIN AND CRYPTOCURRENCIES

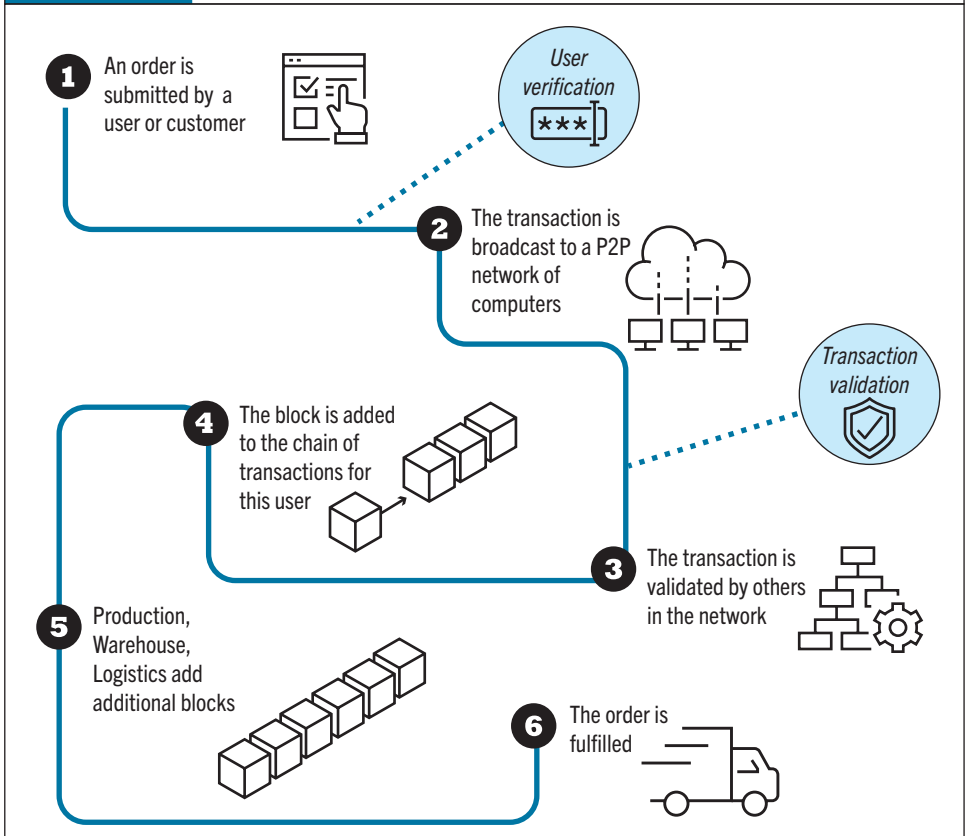
blockchain technology that enables organizations to create and verify transactions on a network nearly instantaneously and without a central authority

Blockchain is a technology that enables organizations to create and verify transactions on a network nearly instantaneously without a central authority. Traditionally, organizations maintained their own transaction processing systems on their own databases and used this record of transactions to keep track of orders, payments, production schedules, and shipping. For instance, when you place an order online, it is entered into a transaction database as an order record. As the order works its way through the firm's factories, warehouses, shipping, and payments processes, the initial record expands to record all this information about this specific order. You can think of this as a *block of information* that's created for every order and that grows over time as the firm processes the order. When the process is completed and the order is fulfilled and paid for, the result is a connected *chain of blocks* (or linked records) associated with that initial order.

Blockchain transforms this process in several ways, but the basic idea of a transaction from start to finish being composed of a chain of blocks of information remains the same. A **blockchain system** is a transaction processing system that operates on a distributed and shared database rather than a single organization's database. The system is composed of a distributed network of computers (called a peer-to-peer [P2P] computer network). Unlike traditional databases, distributed ledgers are managed through a P2P architecture and do not have a centralized database. It is inherently decentralized and is often called a *distributed ledger*. The blockchain maintains a continuously growing list of records called blocks. Each block contains a timestamp and a link to a previous block. Once a block of data is recorded on the blockchain ledger, it cannot be altered retroactively. When someone wants to add a transaction, participants in the network (all of whom have copies of the existing blockchain) run algorithms to evaluate and verify the proposed transaction. Legitimate changes to the ledger are recorded across the blockchain in a matter of seconds or minutes, and records are protected through cryptography. **Figure 5.12** illustrates the basic concepts of a blockchain system.

blockchain system transaction processing system that operates on a distributed and shared database rather than a single organization's database

FIGURE 5.12 HOW BLOCKCHAIN WORKS



A blockchain system is a distributed database that records transactions in a P2P network of computers.

There are many risks in a distributed transaction database that shares transaction information among thousands of firms. A person or firm could enter a false transaction or change an existing transaction. Imposters could falsely claim that a product has shipped even though it has not. Encryption is used to lessen these risks. What makes a blockchain system possible and attractive is encryption and authentication of the participants, which ensures that only legitimate actors can enter information and that only validated transactions are accepted. Once recorded, the transaction cannot be changed.

There are many significant benefits to firms using blockchain databases: Blockchain networks radically reduce the costs of verifying users and validating transactions and the risks of storing and processing transaction information across thousands of firms. While a hurricane or earthquake can destroy a firm's private database, these events would disturb only a single node in the P2P network, with the records remaining stored on all the other nodes in the network. Instead of thousands of firms building their own private transaction systems and then integrating them with the systems of suppliers, shippers, and financial institutions, blockchain offers a single, simple, low-cost transaction system for participating firms. Standardization of recording transactions is aided through the use of *smart contracts*, which are computer programs that implement the rules governing transactions among firms (e.g., what the price of products is, how they will be shipped, when the transaction will be completed, who will finance the transaction, what the financing terms are, and the like). All the elements of a traditional legal contract can be monitored by a smart contract to ensure that the terms are being met by all parties in the transaction.

The simplicity and security that blockchain offers has made it attractive for storing and securing financial transactions, medical records, and other types of data. Blockchain is a foundation technology for cryptocurrencies, described in the next paragraph, as well as supply chain management, which we discuss further in Chapter 12.

cryptocurrency
purely digital asset that works as a medium of exchange using blockchain technology and cryptography

Bitcoin
most prominent example of cryptocurrency in use today

Cryptocurrencies are purely digital assets that work as a medium of exchange using blockchain technology and cryptography. **Bitcoin** is the most prominent example of cryptocurrency in use today, but many other cryptocurrencies have emerged in the last few years. Cryptocurrencies have grown meteorically from no value at all in 2008, when Bitcoin was invented, to a market capitalization of more than $3 trillion in November 2021, although the market value dropped below $1 trillion as of mid-2022 in a market crash (Reineke, 2022). Bitcoin and other cryptocurrencies represent the intersection of complicated technology, economics, geopolitics, and social dynamics. Proponents believe that cryptocurrencies represent the future of money; skeptics believe that collectively, they are destined for narrow use at best and complete collapse at worst.

Bitcoin was created by a mysterious figure or group known only by the pseudonym Satoshi Nakamoto in response to the worldwide financial crises that roiled world markets in the late 2000s. As opposed to traditional paper- and coin-based currencies, which are controlled by central banking systems in the countries that create them, Bitcoin is fully decentralized—no one controls Bitcoin. Instead, Bitcoin is managed through the use of blockchain, which automates the process of synchronizing the ledger. Even the most ardent skeptics of Bitcoin typically accept that blockchain technology has revolutionary potential in fields involving transactions among multiple entities.

Bitcoin's blockchain is maintained by hundreds of thousands of computers that are running specialized Bitcoin software. Each "block" represents a series of transactions

that have been made and is protected with a cryptographic string known as a hash. The hash contains an encrypted timestamp and transaction data pertaining to the values of the transactions that were made, as well as a link to the previous block in the chain; but the identity of the parties to each transaction is protected. Because the blockchain and the ledger are maintained by so many individual users, if anyone attempts to alter the blockchain (for example, to make it seem like they have more Bitcoins than they really do), the discrepancy is quickly detected by thousands of other users and is subsequently corrected. In addition to being fully decentralized, Bitcoin is nearly completely anonymous. While anyone can view completed transactions on the blockchain, they cannot see who made the transactions or how many Bitcoins other users have. Executing a Bitcoin transaction does not require a name or a social security number. Instead, it merely requires a Bitcoin wallet, a simple program that allows you to store and spend Bitcoins, which are protected by encryption keys.

The specialized Bitcoin software that ensures the accuracy of the blockchain is also used to "mine" new Bitcoins into circulation. Central banking systems can print money and control its circulation. Bitcoin decentralizes and widely distributes this responsibility as well. When a Bitcoin is sent from one person to another, the record of that transaction is stored within a block. When enough transactions are completed to fill one block and a new block is required, thousands of miners around the world running this specialized software compete to perform the cryptographic calculations that will protect the data contained within the new block. Whoever completes these calculations first is rewarded with a fixed amount of Bitcoins. As of April 2022, this amount was 6.5 Bitcoins, which was worth something in the amount of $250,000 at the time. This reward is the incentive for users around the world to devote their computing power to running the Bitcoin network. There are only 21 million Bitcoins available to be mined, and as of April 2022, approximately 19 million of these were already in circulation. However, Satoshi Nakamoto stipulated from the outset that the computational power required to mine Bitcoins would increase significantly over time and that the coin reward would also decrease over time, in part to compensate for the rising value of the currency. Just as with gold, there is a fixed number of Bitcoins, and they cannot be created out of thin air; but unlike gold, Bitcoins weigh nothing and cost nothing to store and move.

Cryptocurrency supporters say that the blockchain provides unprecedented security, extremely cheap and fast transfer of funds across borders, limited control by central banking authorities, and the ability to reliably store money for citizens of countries with unstable currencies. However, in practice, cryptocurrencies have earned a reputation as a highly speculative asset whose sudden price fluctuations have prevented it from achieving widespread use for day-to-day purchases. Cryptocurrencies also have a reputation as the preferred method of payment for people buying illegal drugs, guns, and other illicit goods from the Dark Web marketplace, thanks to the currency's anonymity.

Cryptocurrency proponents tout cryptocurrencies' capacity for secure, fast transactions, but cryptocurrencies also turn out to have major issues with theft and fraud. Although cryptocurrencies are secure at the point of transaction, hackers have exploited vulnerabilities in online cryptocurrency exchanges to execute thefts of cryptocurrencies worth millions of dollars. For example, Mt. Gox was an early Bitcoin exchange that was handling 70% of all Bitcoin transactions as of 2014, when it abruptly ceased operations and filed for bankruptcy in the wake of a hack that resulted in the loss/theft of 750,000

Bitcoins, with a value at the time of about $460 million. Since then, there have been hundreds of cryptocurrency hacks, with one of the more recent occurring in March 2022, when hackers stole cryptocurrency worth $615 million from a blockchain linked to Axie Infinity, a popular online game. Without a central bank in charge to address these thefts, cryptocurrency holders often have no recourse to recover their funds.

Another problem relates to the environmental impact of cryptocurrencies. Bitcoin mining worldwide currently consumes an estimated 150 terrawatt-hours of electricity annually, more than the entire amount consumed by Argentina, with a population of 45 million, according to researchers at the University of Cambridge, creating cause for concern (Hinsdale, 2022). As a result, some U.S. state and local governments are considering laws and regulations with respect to cryptocurrency mining that relies on fossil fuels.

Some governments and financial regulatory bodies perceive cryptocurrencies to be a potential threat to the sovereignty of their central banking systems, and a number of countries, such as China, Colombia, Indonesia, Vietnam, and Turkey, have banned their use. However, in general, cryptocurrencies are gaining acceptance in the financial world. In the United States, Wall Street initially regarded cryptocurrencies with intense skepticism but now has stepped up its interest as cryptocurrencies have become more mainstream. At the same time, the market crash in cryptocurrency valuations in mid-2022 has given rise to calls for greater regulation by the U.S. federal government, which for years has warned that investments in such assets are unprotected (Vigna, 2022; Michaels, 2022).

Because Bitcoin has no centralized authority, decisions about the future of the currency are made by its community, and that often leads to disagreements. Other cryptocurrencies have been created to improve upon the model of Bitcoin or to achieve slightly different goals. These are sometimes referred to as "altcoins," and they can be bought and sold along with Bitcoins on all major cryptocurrency exchanges. The Ethereum platform and its related cryptocurrency, Ether, is one of the primary alternatives to Bitcoin. Ethereum can support complex financial software, smart contracts, and other decentralized applications and provides lower transaction costs and faster transaction speeds than Bitcoin. Other alternatives include Ripple and Litecoin. A different type of cryptocurrency, known as stablecoins, is pegged to the value of an external asset, which is supposed to reduce the volatile swings in value that plague cryptocurrencies. Examples of stablecoins include Tether and USD Coin, both of which are pegged to the value of the U.S. dollar. As of May 2022, Bitcoin represents about 44% of the full market for cryptocurrencies, with a variety of different altcoins making up the remainder (Shukla, 2022).

5.6 CAREERS IN E-COMMERCE

With cybercrime in the headlines nearly every day, the number of positions in the cybersecurity field is growing rapidly, with many positions remaining unfilled because of the lack of candidates specifically trained in the field. As a result, many companies are willing to consider non-traditional candidates for these roles. Cybersecurity is an interdisciplinary field that requires knowledge of technology, human behavior, finance, risk, law, and regulation, so students with a broad range of backgrounds may be successful in obtaining entry-level cybersecurity positions. There is particular demand in industries such as

financial services, health care, retail, and education as well as government, all of which have recently suffered high-profile attacks. Security positions are typically also well compensated. Position titles include incident responder, security analyst, security auditor, security engineer, penetration tester, and security software developer, among others.

THE COMPANY

The company is one of the top banking and financial services firms in the United States. Its online website and mobile apps provide financial services to more than 10 million retail customers. The online sites and mobile apps provide nearly all the services available in the company's local branches, including transferring funds, P2P payments, bill payments, online deposits, and payments. The firm believes that in five years, more than 60% of its customers will conduct nearly all their banking transactions, with the exceptions of mortgages and wealth management, online.

Along with other financial services firms of all sizes, the firm is a significant target for hackers and digital criminals. It has suffered a number of security breaches in its online banking operations, including customer data breaches, credit and bank card fraud, denial of service attacks, and phishing threats to its internal systems. As a result, the firm has launched a major cybersecurity division that has a large budget (currently more than $350 million) to protect its customers' assets.

THE POSITION: CYBERSECURITY THREAT MANAGEMENT TEAM TRAINEE

You will be a trainee member of the Cybersecurity Threat Management Team, responsible for supporting and coordinating cybersecurity activities at the firm. Your responsibilities include:

- Responding to requests for information from business partners (internal & external).
- Providing guidance and setting priorities for risk-based threat management, mitigation, and remediation.
- Providing information to stakeholders for their meetings to illustrate and communicate the status of information security risks.
- Advising division managers on responding to security threats and conducting a risk analysis.
- Reviewing, developing, testing, and implementing security plans, products, and control techniques.
- Coordinating the reporting of data security incidents.
- Monitoring existing and proposed security standard-setting groups, including state and federal legislation and regulations.
- Researching attempted efforts to compromise security protocols.

QUALIFICATIONS/SKILLS

- Bachelor's degree in business administration, management information systems, or computer science with coursework in IT security and/or e-commerce security
- Knowledge of security research tools, products, and standards
- Ability to learn vendor and in-house security solutions

- Ability to develop and write scripts for automating security routines
- Ability to achieve SANS Institute security certifications or CISSP (Certified Information Systems Security Professional) certifications
- Ability to develop applications/solutions for enhancing and automating daily routines
- Strong analytical, problem-solving, and conceptual-thinking skills
- Strong writing and presentation skills
- Ability to work with technical and non-technical business managers

PREPARING FOR THE INTERVIEW

This chapter provides much foundational information about the online security environment (Section 5.1), the different types of online security threats (Section 5.2), various technology solutions (Section 5.3), and the development of security plans (Section 5.4). To prepare for the interview, review these sections. You should be able to demonstrate familiarity with various types of threats typically aimed at firms of this type. Reread Section 5.3 to make sure that you can demonstrate basic knowledge of various technology solutions and how they might be used by the firm. Review Section 5.4 so that you can talk about the development of business policies and procedures related to security as well.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. What do you think are the most potentially damaging types of attacks aimed at us?

The breach of customer data is the most damaging, regardless of whether it occurs through a hacking attack or a phishing attack. The second major threat would be a DDoS (Distributed Denial of Service) attack that prevents customers from accessing their accounts. A third major threat is an attack on the firm's networks that connect the branches to the firm's data centers. If these went down, this would severely impact operations.

2. What do you think should be the broad outlines of an online security policy?

To answer this question, you can refer to what you have learned in Section 5.4, and in particular Figure 5.9, about the development of security plans. Any plan needs to start with a risk assessment of the major threats and their potential costs to the firm. A basic security policy is the second step that reflects the risks the firm faces. A third step is to devise an implementation plan that engages managers and employees in all the divisions. Last, an ongoing threat reporting and security audit needs to be in place to measure the effectiveness of the security policies and to identify areas of continued threat.

3. In terms of remedies, what do you believe are the four most important solutions to online security issues for our firm?

To answer this question, you can draw on the information you have learned from Section 5.3 about various technology solutions to online security issues. This is a

complex question because the answer to it depends in part on which products and services are being analyzed. But considering just online consumer retail banking transactions, two-factor authentication at the front end, where customers log in, would be one solution to identity fraud. Encryption of consumer data might also be a possible solution to malware hacking databases that contain personal customer information. More generally, a really solid program for training employees who have access to customer data in security precautions would potentially limit social engineering attacks such as spoofing and phishing. A fourth solution would be to ensure that all internal systems, especially desktops and local networks, are current with upgrades issued by the major software and hardware vendors.

4. As you probably know, social engineering, such as phishing, is a major threat for us. What would you recommend for minimizing this threat?

To answer this question, you can refer to information contained in Section 5.2 on social engineering and phishing, making reference to the growing use of business e-mail compromise phishing and W-2 phishing. You can suggest that spreading awareness of these types of attacks among the workforce may make it less likely that employees will fall prey to them. You might also note that social engineering attacks, and cybercriminals gaining access to customer accounts, will occur despite the best security policies. It is a matter of when, not if. Having plans in place to cope with these inevitable occurrences is the best policy for minimizing the impacts of these attacks.

5. Many security techniques impose costs on our customers. The more powerful our security software, hardware, and protocols, the greater the chance customers will find our online sites more difficult to use and slower. What do you think we should do about this dilemma?

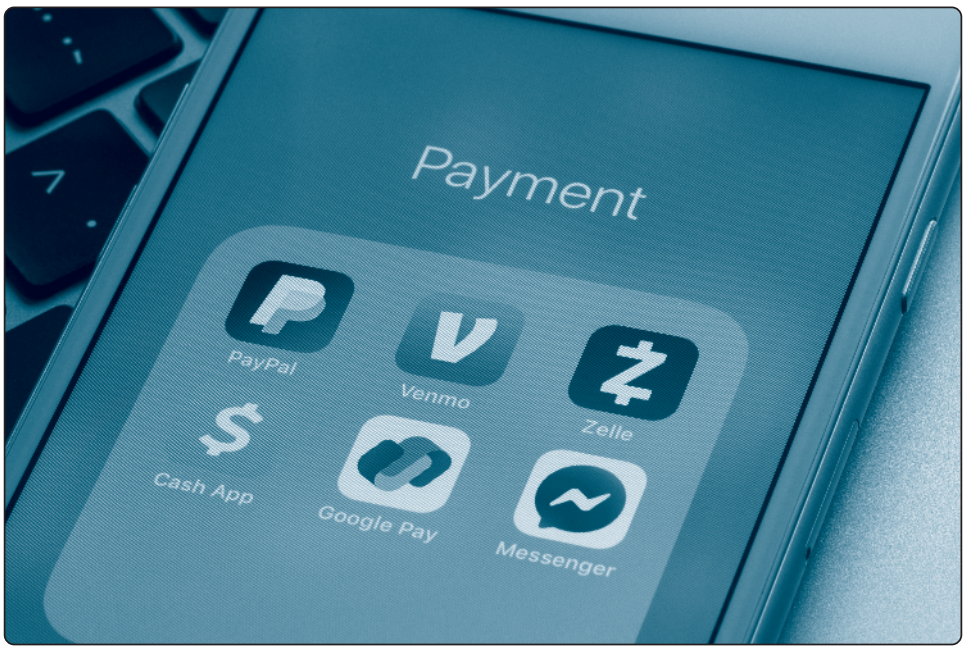
To answer this question, you can draw on the information in Section 5.1 on the tension between security and other values, such as ease of use. You might suggest that all security policies and procedures be analyzed for their potential impact on customer services and system performance. Based on this analysis of system performance, the delays in system performance caused by security protocols can be measured. Surveys of consumers can also produce data indicating how security measures impact perceptions of service quality. Most customers will not notice delays of a few milliseconds in system response times but would notice a five-second delay in service. A data and analytics approach could help resolve this situation.

5.7 CASE STUDY

Mobile Payments:
Fintech versus the Bank Giants

Nearly every day, it seems, a new mobile payment system is announced by tech startups, giant technology firms, national retail merchants, or banks. There are thousands of fintech (short for "financial technology") firms hoping to disrupt the existing financial services and payment marketplace, both online and offline, which is now dominated by traditional banking and credit card firms. Fintech firms want to become the user interface between the consumer and the banks, earning their revenue by taking a slice of the transaction. One way they hope to disrupt the traditional banking system is by using mobile apps to replace credit cards and enabling transfers among friends (P2P payments).

The term fintech originally was used to characterize startup technology firms that aimed to improve a variety of financial services from depositing and withdrawing funds to making investments, obtaining loans, and making payments, both to merchants and to individuals. In the last few years, traditional banks and credit card companies, as well as large national merchants, have developed their own apps for their customers, and the term fintech no longer applies just to startup tech companies.



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The competition between fintech and traditional banking institutions is creating an explosion of innovative ideas, plans, and announcements, which one commentator has likened to a goat rodeo: a chaotic situation in which powerful players with different agendas compete with one another for public acceptance and, above all, huge potential revenues. The mobile payment market, for instance, is a battle among tech titans, such as PayPal, Google, Apple, Samsung, and startup tech companies backed by millions in venture capital, and the bank and credit card giants, who are building their own mobile payment systems and investing in startups to lead the charge. Large retailers like Walmart, Best Buy, and Target have also jumped into the fray by developing their own branded mobile payment apps.

The banks and credit card companies, after a number of years of inaction, decided they wanted to continue to be the customer interface to their banking services, both in terms of credit and debit cards and as the digital interface for their customers using mobile apps. After all, debit cards in the United States account for more than $3 trillion in transactions, while credit cards generate almost $4 trillion in transactions. The traditional bank and credit card companies want to hold onto this card interface with the consumer. But even if a tiny percentage of the $7 trillion card-transaction marketplace moves from plastic to mobile devices, the potential revenue is very large. On the other hand, moving consumers away from their credit and debit cards, which can be swiped at millions of merchants' physical locations and used online with ease and safety, is proving to be a difficult task. A Pew Research survey found that although younger people are more likely to use mobile payments, there is still much skepticism and concern about using financial technologies, and across all generations, people are still more likely to trust traditional methods, such as using credit and debit cards. The rosy future of mobile payments painted by fintech companies may be a long time coming.

As previously described in the chapter, there are three types of mobile payment apps. Universal proximity payment systems such as Apple Pay, Google Pay, and Samsung Pay can be used at participating merchants as a point-of-sale payment. Branded proximity payment systems, such as Walmart Pay, also use proximity technology but can be used only at a single merchant's stores. A third type involves payments among individuals, P2P payments, which can be used to transfer funds among users who have installed a proprietary app, such as Venmo, Zelle, or Square Cash.

In the United States, the total mobile payment market is expected to generate around $1.5 trillion in transaction volume in 2022, with mobile P2P payments accounting for almost $1.1 trillion of that amount and mobile proximity payments accounting for around $415 billion. Growth in payment transaction value skyrocketed between 2019 and 2021, in part because of the Covid-19 pandemic, but is expected to moderate in the coming years as the market becomes saturated. About 60% of smartphone users use mobile P2P payments, while about 40% use mobile proximity payments some of the time. The fastest growth in proximity point-of-sale payments has been in branded mobile payment systems such as Walmart Pay and those offered by other large national retailers.

Growth in newer forms of mobile payments is strongest among Millennials and Gen Z-ers, who have significantly decreased their use of checks and who, unlike their parents, are comfortable handling their financial transactions using a smartphone. For instance, more than 70% of Millennial smartphone users use P2P mobile payments in 2022, compared to just 38% of Baby Boomer mobile phone users.

Venmo is a good example of a pioneering mobile P2P fintech firm. Venmo is a social-mobile payment app that lets users transfer money to one another. It can also be used to pay at a small number of participating merchants. Venmo was founded in 2010 by two college students who wanted to send cash to one another for sharing restaurant tabs and paying small debts without the hassle of using cash or writing checks. Users sign up for a Venmo account and link their account to a bank account, a debit card, or a credit card. Users can also create a pre-paid Venmo balance by sending money to their Venmo account and then charge payments against that balance. There is no charge for the service when users have a Venmo balance or use a debit card but a 3% charge for using a credit card as the source of funds. There is a social aspect of Venmo that allows users to share their purchase events (but with the amount paid stripped from the notification). Users have the option to keep all transactions private as well. When they want to make a payment to another person, they enter the person's e-mail, and the funds are transferred when the recipient, who must also have a Venmo account, accepts the payment. Venmo relies on NFC technology to make in-person payments to individuals by tapping their phones possible. Venmo was purchased by PayPal in 2013, and its popularity has skyrocketed, especially among Millennials and Gen Z-ers; and in 2021, it processed more than $210 billion in transactions, a 43% increase over the previous year. In 2022, Venmo has more than 75 million users. PayPal has begun to monetize its investment in Venmo by expanding beyond small peer-to-peer payments and extending its use to merchants that accept PayPal payments, a much larger user base, which includes large retailers like Home Depot, Kohl's, Target, and OfficeMax. PayPal also offers instant transfers from Venmo accounts to a user's bank account for a small fee, a Venmo credit card, and cryptocurrency trading functionality. As a result, Venmo has significantly evolved from being just a P2P payment platform, and many analysts believe that PayPal will continue to morph Venmo into a digital wallet "super app" with many different functionalities and, thus, monetization options. Venmo's audience of primarily Millennial and Gen Z users is also very valuable to PayPal.

Fintech startups have had a tough time competing with the tech giants in the mobile payment market, as evidenced by Venmo's acquisition by PayPal. First in terms of subscribers are the technology companies like Apple, Google, Samsung, PayPal, and Square, all of which have major hardware and software mobile payment initiatives. Apple, Google, and Samsung own the hardware and software platforms of the ubiquitous smartphone, making their devices and services more useful to consumers, while PayPal and Square operate large-scale online payment-processing platforms and apps that can be used on all smartphones. Apple Pay is the leader in mobile proximity payment, with about 45 million users in 2022, followed by Google Pay, with around 25 million users, and Samsung Pay, with about 14 million.

Proximity point-of-sale systems are free to consumers, and the credit card companies charge their usual fee of 3% for each transaction when a credit card is used to pay for the purchase. Most charge a fee to support their systems. For instance, Apple collects 0.15% from the credit card companies and banks and, in return, guarantees that the transaction is valid. Apple Pay does not store any user funds and is solely a technology-based intermediary between consumers and banks, and, unlike Venmo, it is not subject to federal banking regulations because it does not store funds. Merchants'

point-of-sale terminals need to be NFC-enabled, and merchants need to install Apple software to accept payments. Apple Pay can be used by any consumer who has a credit card from a major issuer bank.

Proximity payment digital wallets are still a relatively small factor in mobile payments in 2022, and the growth in their usage is slower than originally anticipated. Although adoption rates are relatively high, primarily because anyone who buys a smartphone is encouraged to install the phone's associated payment app as part of the initialization of the phone, only a smaller percentage of those who "adopt" actually use the apps on a regular basis, in large part because merchants have been slow adopters of NFC equipment and because consumers still find credit and debit cards to be more convenient. However, usage of mobile payment apps surged during the pandemic, and analysts estimate that proximity mobile spending will reach more than $960 billion by 2026, more than doubling the spending in 2022.

The experience for branded merchant mobile payments has been quite different and was largely unexpected because retail merchants were perceived to be behind the technology curve. Merchants are loathe to give up their relationships with their own customers to tech companies or even credit card companies and prefer to offer their own, branded payments, from store credit cards to mobile payments. These branded mobile payment systems are used for loyalty rewards, local product promotion, and harvesting purchase data from their customers. Starbucks is the leader here, with almost 33 million of its customers using the app; Walmart, Dunkin', Target, Kohl's, Panera, Chipotle, and many other retailers also offer their own mobile payment systems.

Banks like JPMorgan Chase, Wells Fargo, Citi, and other money-center banks and, of course, the credit card companies Visa, Mastercard, and others are the third major players. These firms have the advantage of owning and operating the global banking and credit card systems, with hundreds of millions of trusting and loyal banking and credit card customers and the expertise to provide security and financial stability for their products. They are, however, late to the game and are just now entering the mobile payment marketplace.

Zelle is a leading example of how the traditional banking industry has responded to fintech. Zelle is a digital payment service that allows bank customers to make digital payments and transfers to other account holders using an app and to receive payments from others. Users need to know either the e-mail or the cellphone number of the recipients. The transfers are nearly instantaneous and are referred to as instant payments, in contrast to other digital payments systems, which typically require one business day or more to be completed. Originally founded in 2011 as ClearXchange by a consortium of the largest banks in the United States (JPMorgan Chase, Wells Fargo, and Bank of America), Zelle has grown to include more than 10,000 financial institutions and also works with Mastercard and Visa to support P2P payments with debit or credit cards. Transfers and payments among existing accounts are free and typically rely on customers' existing checking accounts.

Zelle is tightly integrated with banking services such as wire transfers, global wire services, depositing checks using image recognition, and ACH (Automated Clearing House) direct debit and deposit transactions, such as automatic payments of recurring bills from utility, telephone, rent, and even charitable contributions. ACH is a digital

clearinghouse and the primary means of direct money transfers in the United States. It is operated by the Federal Reserve and participating banks. In short, Zelle enables nearly the complete range of banking services using smartphones and PCs without having to use local branch banks, except for mortgages and personal loans. But Zelle currently is not useful as a point-of-sale payment device using NFC technology, and here is where the proximity and branded proximity payment systems like Apple Pay and Walmart Pay have an advantage. However, there is nothing preventing Zelle from adding a proximity payment capability in the future.

Not originally intended as a P2P payment service, Zelle introduced Zelle QuickPay in 2017 and rolled it out to mobile banking customers at 30 national banks. Payments are free, and funds transfer in a few minutes, rather than overnight, for Venmo, Square Cash, or others in this market. Within one year of its introduction, Zelle had attracted nearly 30 million users. In 2022, almost 62 million people in the United States use Zelle, more than 40% of all P2P mobile payment users. In 2021, Zelle processed more than $365 billion in payments, well ahead of Venmo's $210 billion.

However, mobile payment systems, especially P2P payments, are not without issues. Generally, P2P and mobile payments at online stores are not reversible. If users send funds to the wrong e-mail or phone number, there is no guarantee that the receiver will return the funds, and payments to online merchants cannot be retrieved if the merchant does not send out the goods. In addition, phishing and social engineering can be used to drain funds out of accounts.

Confused by all these mobile payment options? You're in good company: So are many consumers and retail merchants. The transition to mobile payments is going much more slowly than analysts initially anticipated, with millions of consumers trying the new methods once but then not using them again because not enough merchants accept them, because of a lack of familiarity with them, and because of concerns about their security and privacy. Although the P2P payment market has shown spectacular growth, especially among Millennials and Gen Z-ers, utilization growth has slowed, and in the scheme of things, this is a small market that is vulnerable to P2P bank products like Zelle. Clearly, the Zelle network of the largest banks in the United States has the advantage in mobile payments with a large installed base of loyal customers, financial heft, and the ability to buy whatever technology is needed to build an integrated mobile payment system. Even so, most consumers are still happy to swipe their cards for online and in-store purchases. It is quite likely that consumers will remain confused by all their payment options for some time to come.

SOURCES: "US Proximity Mobile Payments 2022," by Jaime Toplin, Insider Intelligence/eMarketer, May 27, 2022; "P2P Mobile Payment Uses, by Platform," Insider Intelligence/eMarketer, March 2022; "Venmo P2P Transaction Value," Insider Intelligence/eMarketer, March 2022; "PayPal's Venmo Is Morphing into a 'Super App': BofA," by Emily McCormick, News.yahoo.com, August 31, 2021; "Federal Reserve Payments Study," Federalreserve.gov, December 2021; "Retailers Are Embracing Mobile Payments," Insider Intelligence/eMarketer, November 21, 2019; "Zelle's Bumpy Ride toward Ubiquity," by Penny Crosman, *American Banker*, April 25, 2018; "Zelle, the U.S. Banks' Venmo Rival, Will Launch Its Mobile App Next Week," by Sarah Perez, Techcrunch.com, September 8, 2017; "Venmo: Its Business Model and Competition," by Seth Shobhit, Investopedia.com, April 28, 2017; "As Millennials 'Venmo' Each Other Money, Banks Fight Back with Their Own Mobile Apps," by James Koren, *Los Angeles Times*, March 27, 2017.

Case Study Questions

1. What are the three types of mobile payments, and how do they differ?
2. Which age groups are the most likely to adopt mobile payment apps? Why?
3. Why have fintech startups had a hard time competing with the tech giants?
4. What is Zelle, and why has it grown so quickly in the last few years?

5.8 REVIEW

KEY CONCEPTS

■ Understand the scope of e-commerce crime and security problems, the key dimensions of e-commerce security, and the tension between security and other values.

- While the overall size of cybercrime is unclear, cybercrime against e-commerce sites is growing rapidly, the amount of losses is growing, and the management of e-commerce sites must prepare for a variety of criminal assaults.
- There are six key dimensions to e-commerce security: integrity, nonrepudiation, authenticity, confidentiality, privacy, and availability.
- Although computer security is considered necessary to protect e-commerce activities, it is not without a downside. The more security measures that are added to an e-commerce site, the more difficult it is to use and the slower the site becomes, hampering ease of use. Security is purchased at the price of slowing down processors and adding significantly to data storage demands. Too much security can harm profitability, while not enough can potentially put a company out of business.

■ Identify the key security threats in the e-commerce environment.

- The most common and most damaging forms of security threats to e-commerce sites include:
  - *Malicious code*—viruses, worms, ransomware, Trojan horses, and bot networks are a threat to a system's integrity and continued operation, often changing how a system functions or altering documents created using the system.
  - *Potentially unwanted programs (adware, browser parasites, spyware, etc.)*—a kind of security threat that arises when programs are surreptitiously installed on your computer or computer network without your consent.
  - *Phishing*—any deceptive, online attempt by a third party to obtain confidential information for financial gain.
  - *Hacking, cybervandalism, and hacktivism*—intentionally disrupting, defacing, or even destroying a site.
  - *Data breaches*—the loss of control over corporate information, including the personal information of customers and employees, to outsiders.
  - *Credit card fraud/theft*—one of the most-feared occurrences and one of the main reasons more consumers do not participate in e-commerce. The most common cause of credit card fraud is a the systematic hacking and looting of a corporate server where the information on millions of credit card purchases is stored.
  - *Identity fraud*—involves the unauthorized use of another person's personal data, such as social security, driver's license, and/or credit card numbers, as well as usernames and passwords, for illegal financial benefit.
  - *Spoofing*—occurs when hackers attempt to hide their true identities or misrepresent themselves by using fake e-mail addresses or masquerading as someone else.
  - *Pharming*—involves redirecting a web link to an address different from the intended one, with the site masquerading as the intended destination.
  - *Spam (junk) websites (link farms)*—sites that promise to offer some product or service but, in fact, are just a collection of advertisements for other sites, some of which contain malicious code.

- *Sniffing*—a type of eavesdropping program that monitors information traveling over a network, enabling hackers to steal proprietary information from anywhere on a network, including e-mail messages, company files, and confidential reports.
- *Man-in-the middle (MiTM) attack*—attack in which the attacker is able to intercept communications between two parties who believe they are directly communicating with one another, when in fact the attacker is controlling the communications.
- *Denial of Service (DoS) and Distributed Denial of Service (DDoS) attacks*—hackers flood a website with useless traffic to inundate and overwhelm the network, frequently causing it to shut down and damaging a site's reputation and customer relationships.
- *Insider attacks*—although the bulk of Internet security efforts are focused on keeping outsiders out, the biggest threat is from employees who have access to sensitive information and procedures.
- *Poorly designed software*—the increase in complexity and size of software programs has contributed to an increase in software flaws or vulnerabilities, including SQL injection attacks and zero-day vulnerabilities, that hackers can exploit.
- *Social network security issues*—malicious code, PUPs, phishing, data breaches, identity fraud, and other e-commerce security threats have all infiltrated social networks.
- *Mobile platform security issues*—the mobile platform presents an alluring target for hackers and cybercriminals and faces all the same risks as other Internet devices, as well as new risks associated with wireless network security.
- *Cloud security issues*—as devices, identities, and data become more and more intertwined in the cloud, safeguarding data in the cloud becomes a major concern.
- *Internet of Things (IoT) security issues*—IoT raises a host of security issues that are in some ways similar to existing security issues but that are even more challenging, given the need to deal with a wider range of devices, operating in a less controlled, global environment, and with an expanded range of attack.
- *Metaverse security issues*—malware is also likely to be targeted at the metaverse; participants may be subject to harassment, identity theft, and theft of digital assets. The lack of privacy of participants and security of their personal information is also a concern.

■ Describe how technology helps to secure Internet communications channels and protect networks, servers, and clients.

- Encryption is the process of transforming plain text or data into cipher text that cannot be read by anyone other than the sender and the receiver. Encryption can provide four of the six key dimensions of e-commerce security: message integrity, nonrepudiation, authentication, and confidentiality.
- There are a variety of different forms of encryption technology currently in use. They include:
  - *Symmetric key cryptography*—Both the sender and the receiver use the same key to encrypt and decrypt a message.
  - *Public key cryptography*—Two mathematically related digital keys are used: a public key and a private key. The private key is kept secret by the owner, and the public key is widely disseminated. Both keys can be used to encrypt and decrypt a message. Once the keys are used to encrypt a message, the same keys cannot be used to unencrypt the message.
  - *Public key cryptography using digital signatures and hash digests*—This method uses a mathematical algorithm called a hash function to produce a fixed-length number called a hash digest. The results of applying the hash function are sent by the sender to the recipient. Upon receipt, the recipient applies the hash function to the received message and checks to verify that the same result is produced. The sender then encrypts both the hash result and the original message using the recipient's public key, producing a single block of cipher text. To ensure both authenticity of the message and nonrepudiation, the sender

encrypts the entire block of cipher text one more time using the sender's private key. This produces a digital signature or "signed" cipher text that can be sent over the Internet to ensure the confidentiality of the message and to authenticate the sender.
    - *Digital certificates and public key infrastructure (PKI)*—This method relies on certification authorities who issue, verify, and guarantee digital certificates (a digital document that contains the name of the subject or company, the subject's public key, a digital certificate serial number, an expiration date, an issuance date, the digital signature of the certification authority, and other identifying information).
  - In addition to encryption, there are several other tools that are used to secure Internet channels of communication, including Transport Layer Security (TLS) and HTTPS, virtual private networks (VPNs), and wireless security standards such as WPA3.
  - After communications channels are secured, tools to protect networks, the servers, and clients should be implemented. These include firewalls, proxies, intrusion detection and prevention systems (IDS/IDP), operating system and application software security enhancements, and anti-virus software.

■ Appreciate the importance of policies, procedures, and laws in creating security.

- In order to minimize security threats, e-commerce firms must develop a coherent corporate policy that takes into account the nature of the risks, the information assets that need protecting, the procedures and technologies required to address the risks, as well as implementation and auditing mechanisms.
- Public laws and active enforcement of cybercrime statutes also are required to both raise the costs of illegal behavior on the Internet and guard against corporate abuse of information.
- The key steps in developing a security plan are:
  - *Perform a risk assessment*—an assessment of the risks and points of vulnerability.
  - *Develop a security policy*—a set of statements prioritizing the information risks, identifying acceptable risk targets, and identifying the mechanisms for achieving these targets.
  - *Create an implementation plan*—a plan that determines how you will translate the levels of acceptable risk into a set of tools, technologies, policies, and procedures.
  - *Create a security team*—the individuals who will be responsible for ongoing maintenance, audits, and improvements.
  - *Perform periodic security audits*—routine reviews of access logs and any unusual patterns of activity.

■ Identify the major e-commerce payment systems in use today.

- The major types of e-commerce payment systems in use today include:
  - *Online credit card transactions*, which is the primary form of online payment system. There are five parties involved in an online credit card purchase: consumer, merchant, clearinghouse, merchant bank (sometimes called the "acquiring bank"), and the consumer's card-issuing bank. However, the online credit card system has a number of limitations involving security, merchant risk, cost, and social equity.
  - *Alternative online payment systems*, such as PayPal, which is an online stored value payment system that permits consumers to make instant, online payments to merchants and other individuals based on the value stored in an online account. Other examples include Amazon Pay, Meta Pay, Visa Checkout, MasterPass, and Buy Now Pay Later (BNPL) services such as Klarna and Afterpay.
  - *Mobile payment systems*, which include universal proximity wallets such as Apple Pay, Google Pay, and Samsung Pay; branded store proximity wallets such as Walmart Pay and Starbucks Pay; and P2P mobile payment apps such as Venmo, Zelle, and Square Cash.
  - *Cryptocurrencies* based on blockchain technology, such as Bitcoin and other altcoins. Cryptocurrencies are growing in importance and can be used to hide payments from authorities as well as to support the legitimate exchange of value.

QUESTIONS

1. Why is it less risky to steal online? Explain some of the ways cybercriminals deceive consumers and merchants.
2. Explain why an e-commerce site might not want to report being the target of cybercriminals.
3. Give an example of security breaches as they relate to each of the six dimensions of e-commerce security. For instance, what would be a privacy incident?
4. How would you protect your firm against a DoS or DDoS attack?
5. Name the major points of vulnerability in a typical online transaction.
6. How does spoofing threaten a website's operations?
7. Why is adware considered to be a security threat?
8. What are some of the steps a company can take to curtail cybercriminal activity within the business?
9. Explain some of the modern-day flaws associated with encryption. Why is encryption not as secure today as it was earlier in the century?
10. Briefly explain how public key cryptography works.
11. Compare and contrast firewalls and proxy servers and their security functions.
12. Is a computer with anti-virus software protected from viruses? Why or why not?
13. Identify and discuss the five steps in developing an e-commerce security plan.
14. How do biometric devices help improve security? What particular type of security breach do they reduce?
15. Briefly discuss the disadvantages of credit cards as the standard for online payments. How does requiring a credit card for payment discriminate against some consumers?
16. Describe the major steps involved in an online credit card transaction.
17. Why is Bitcoin so controversial?
18. What is NFC, and how does it work? How does it differ from QR code technology?
19. How does an online stored value payment system differ from a BNPL service?
20. What are some of the security risks associated with the metaverse?

PROJECTS

1. Imagine you are the owner of an e-commerce website. What are some of the signs that your site has been hacked? Discuss the major types of attacks you could expect to experience and the resulting damage to your site from each one. Prepare a brief summary presentation.

2. Given the shift toward m-commerce, do a search on m-commerce crime. Identify and discuss the security threats this type of technology creates. Prepare a presentation outlining your vision of the new opportunities for cybercrime that m-commerce may provide.

3. Find three certification authorities, and compare the features of each company's digital certificates. Provide a brief description of each company as well, including its number of clients. Prepare a brief presentation of your findings.

4. Research the challenges associated with payments across international borders, and prepare a brief presentation of your findings. Do most e-commerce companies conduct business internationally? How do they protect themselves from repudiation? How do exchange rates impact online purchases? What about shipping charges? Summarize by describing the differences between a U.S. customer and an international customer who each make a purchase from a U.S. e-commerce merchant.

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PART 3

- **CHAPTER 6**
  E-commerce Marketing and Advertising Concepts
- **CHAPTER 7**
  Social, Mobile, and Local Marketing
- **CHAPTER 8**
  Ethical, Social, and Political Issues in E-commerce

Business Concepts and Social Issues

CHAPTER 6

E-commerce Marketing and Advertising Concepts

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

6.1 Understand the key features of the online audience, the basic concepts of consumer behavior and purchasing, and how consumers behave online.
6.2 Identify and describe the basic digital commerce marketing and advertising strategies and tools.
6.3 Identify and describe the main technologies that support online marketing.
6.4 Understand the costs and benefits of online marketing communications.

NEW Video Cases

See **eText Chapter 6** to watch these videos and complete these activities:

6.1 Google and the Digital Ad Market

6.2 Mutiny Uses AI and No-Code to Improve AdTech

Video Ads:

Shoot, Click, Buy

© JpegPhotographer/Shutterstock

The age of online video ads is upon us. Improvements in video production tools, higher bandwidth, and better streaming quality have fueled an online video surge. In addition, the ways that online video can be viewed have also expanded, from desktop computers and laptops to smartphones, tablets, and, increasingly, over-the-top (OTT) Internet-enabled television sets (also known as connected TVs [CTV]).

The online audience for videos is huge. Almost 260 million Americans (more than 75% of the general population) watch online video content at least once a month. YouTube is the top U.S. online video content property, with more than 230 million unique viewers in the United States and almost 2.1 billion worldwide. Other top online video content properties include Comcast's NBCUniversal and Disney.

Because this is where the users are, video has become a prime advertising medium. Although click-throughs on banner ads are minuscule (fewer than five clicks per 10,000 impressions), video ads are another story. Video ad completion rates range from 57% when viewed within a mobile browser, to 65% when viewed on a desktop, to more than 70% when viewed within a mobile app. Metrics are even better for CTV, where recent research indicates that viewers completed watching 98% of all video ads shown. In addition, nearly 100% of online spenders are video viewers, and they provide a highly desirable demographic with strong buying power. According to Google, 70% of YouTube viewers say that they purchased a brand item as a result of seeing it on YouTube. As a result, advertisers are jumping on the bandwagon. Leading online video advertising platforms include Google Ads (which includes YouTube), Meta (Facebook and Instagram), Yahoo, Tremor Video, and Chocolate Platform (formerly Vdopia).

Many large firms now have YouTube channels that they use as a marketing and advertising branding platform. For instance, Apple is one of the most popular YouTube brand channels, with almost 16 million subscribers. Other major brands include Lego, with almost 15 million; Red Bull, with more than 10 million; Disney, with more than 5 million; Coca-Cola, with almost 4 million; and Ford, with more than 2 million.

Smaller firms are also using YouTube channels as a branding platform. Orabrush is an example of a small firm that successfully used YouTube videos to build its business from the ground up. Dr. Robert Wagstaff, a dentist who invented a breath-freshening

tongue cleaner, was unsuccessful in marketing it through traditional channels. Jeffrey Harmon, an MBA student at nearby Brigham Young University whom Wagstaff had hired on a part-time basis, convinced him to give YouTube videos a try. He initially posted a YouTube video called "How to tell if you have bad breath" on Orabrush's landing page and found that it tripled Orabrush's conversion rate. From there, they decided to create Orabrush's own YouTube channel. Today that original video has more than 26 million views, and Orabrush's YouTube channel has around 170,000 subscribers and a total of almost 40 million video views (more than those of major brands such as Colgate and Johnson & Johnson), and, more importantly, has resulted in sales of more than 3 million units. Orapup, a sister brand for dogs, has also used the same kind of video marketing model with great success, connecting with the pet community and generating almost 28 million views, more than those of major pet brands Purina, Pedigree, and Iams, combined. The Orabrush product line has since been acquired by Dentek.

YouTube is also a pre-eminent platform for online video ads and in 2022 is expected to generate more than $8 billion in video ad revenue in the United States. YouTube offers advertisers a variety of video ad formats. In-stream ads play before, during, or after other videos. Skippable in-stream ads allow viewers to skip the ad after five seconds and go directly to the video they want to watch. The advertiser is not charged unless the viewer watches the full ad or, for longer ads, for at least 30 seconds. This type of ad, in effect, gives advertisers five free seconds of branding. But because many viewers automatically skip video ads, YouTube also offers non-skippable in-stream ads. Bumper ads are very short (six seconds or less), non-skippable ads that are aimed at increasing brand awareness by delivering a brief but memorable message, whereas "regular" non-skippable ads can run for up to 15 seconds. In-feed video ads (formerly called video discovery ads) appear as a thumbnail image on YouTube search results pages, alongside related YouTube videos, and on the YouTube mobile home page. The advertiser is charged only when viewers choose to watch the ad by clicking on the thumbnail image of it.

Google has taken a number of steps to enhance the effectiveness of online video ads for advertisers. As with many other types of online advertising, ads can be targeted based on audience demographics and other behavioral data. For instance, the custom audience feature allows advertisers to reach users on YouTube based on their interactions with other Google products, such as Google search queries, locations visited on Google Maps, or apps installed from Google Play. Advertisers can also use what Google calls dynamic remarketing (another name for retargeting), which allows advertisers to show ads based on what users previously viewed on the advertiser's website. Advertisers believe that such targeting allows them to deliver ads that people actually want to watch and engage with, which is attractive to advertisers because when viewers actively decide to watch, they are believed to have a greater level of interest.

TrueView is a term that YouTube used in the past to refer to ads that advertisers have to pay for only when a user chooses to watch the ad. TrueView for action ad campaigns (which as of April 2022 are called Video action campaigns) are based on in-stream skippable ads and include a prominent clickable call-to-action (CTA), text overlay headlines, and website links. TrueView for shopping is a variation on TrueView for action that enables advertisers to include images, product offers with prices, and the ability to click through to

a brand's products, allowing viewers to easily purchase items directly from the advertiser's website. In November 2021, Google extended the TrueView for Shopping's product feeds feature to all video campaign types and began the process of retiring the TrueView name. Two advertisers that have used TrueView for shopping are online furniture retailer Wayfair and beauty products retailer Sephora. Wayfair created product-specific videos with tips for decorating, and included product prices, whereas Sephora created a series of how-to videos, tutorials, and curated product recommendations. Using an attribution system that it developed that allowed it to directly tie revenue back to specific customers who had been exposed to a TrueView for shopping ad, Wayfair reported that the ads generated three times as much revenue compared to its traditional video ads. Sephora reported that its ads delivered a 54% lift in ad recall and an 80% lift in brand consideration, with an average view time of two minutes.

However, despite the success of video ads in general and YouTube in particular, video ads still have some hurdles to face. One of advertisers' major concerns is the issue of viewability—whether video ads are actually seen. In the past, industry standards with respect to when a video ad was considered to be viewable were extremely low: Just 50% of the ad's pixels had to be visible on screen for at least two consecutive seconds. In 2019, that standard was raised to require that 100% of the ad be visible for that time period, an improvement but still an extremely low bar. YouTube has been very responsive to advertisers' concerns about viewability and created its TrueView brand of ads in part because of those concerns.

Concerns about brand safety are another issue. In the past, Google had to put a temporary hold on TrueView discovery ads after hundreds of advertisers began pulling their YouTube advertising when it was discovered that some of their ads were appearing in conjunction with what they deemed to be objectionable content. Google committed to steps that will help prevent ads from appearing in association with controversial videos, but the effort is complicated by YouTube's scale and diversity—the very things that make it such an attractive advertising platform—and this remains a continuing issue for YouTube and not one that is likely to be easily solved.

SOURCES: "About YouTube Ads," Support.google.com, accessed August 2, 2022; "Top U.S. Online Video Content Properties Ranked by Unique Video Viewers June 2022," Comscore.com, July 2020; "Extreme Reach Video Benchmarks Q4 2021 & Q1 2022," by Extreme Reach, Tvamediagroup.com, May 26, 2022; "US YouTube Video Ad Revenues," Insider Intelligence/eMarketer, March 2022; "The Complete Guide to YouTube Marketing in 2022," by Michelle Martin, Blog.hootsuite.com, December 7, 2021; "Product Feeds Now Available for More Video Campaign Types, Support." Google.com, November 12, 2021; "YouTube Quietly Pauses Search Ads to Implement Brand Safety Measures," by Ginny Marvin, Marketingland.com, May 5, 2017; "Herein Lies the Tale of a Tongue Toothbrush, YouTube, and 'Reverse Marketing,'" by Barry Levine, Venturebeat.com, February 3, 2015; "As Seen on YouTube! Orabrush Reinvents the Infomercial," by Joseph Flaherty, Wired.com, May 21, 2012.

Perhaps no area of business has been more affected by Internet and mobile platform technologies than marketing and marketing communications. As a communications tool, the Internet affords marketers new ways of contacting millions of potential customers at costs far lower than traditional media. The Internet also provides new ways—often instantaneous and spontaneous—to gather information from customers, adjust product offerings, and increase customer value. The Internet has spawned entirely new ways to identify and communicate with customers, including search engine marketing, behavioral targeting, and targeted e-mail and social marketing, among others. And the Internet was just the first transformation. Today, the mobile platform based on smartphones and tablet computers is transforming online marketing and communications yet again. **Table 6.1** summarizes some of the significant new developments in online marketing and advertising for 2022–2023.

TABLE 6.1 WHAT'S NEW IN ONLINE MARKETING AND ADVERTISING 2022–2023

BUSINESS
• Online marketing and advertising spending rebounded sharply in 2021, increasing by almost 40%, and is expected to continue to increase through 2026, when it is expected to comprise almost 80% of all ad spending. • Mobile devices provide the platform for more than two-thirds of all digital advertising spending, while the amount of advertising on connected TVs (CTV) also increases, blurring the lines between traditional television advertising and digital advertising. • Search engine marketing and advertising continues in importance, but its rate of growth is slowing somewhat compared to that of other formats. • Digital video ads remain the fastest-growing ad format, with spending anticipated to increase in 2022 by more than 25%. • Social network advertising and marketing spending continues to expand. • Viewability issues and ad fraud continue to cause concerns for marketers. • Native advertising and other forms of content marketing rise.
TECHNOLOGY
• Big data: Online tracking produces oceans of data, challenging business analytics programs. • Programmatic advertising (automated, technology driven method of buying and selling display and video ads) maintains its prominence. • Marketers seek new technologies to replace behavioral targeting. • Concerns about the effectiveness of available methods to measure the impact of online advertising, particularly video advertising, rise.
SOCIETY
• Targeted advertising based on behavioral tracking leads to growing privacy awareness and fears, leading Big Tech firms such as Apple and Google to adopt policies that prevent certain types of user tracking. • Marketers become increasingly concerned about placement of their ads next to controversial online content, giving rise to advertising boycotts and companies focusing on brand safety. • The concentration of power in the online advertising industry, particularly Google's, leads to mounting calls for regulation.

The subject of online marketing, branding, and market communications is very broad and deep. We have created two chapters to cover the material. In this chapter, we begin by examining online consumer behavior, the major types of online marketing and branding, and the technologies that support advances in online marketing. We then focus on understanding the costs and benefits of online marketing communications. In Chapter 7, we focus on the social, mobile, and local marketing phenomenon in greater depth.

6.1 CONSUMERS ONLINE: THE ONLINE AUDIENCE AND CONSUMER BEHAVIOR

Before firms can begin to sell their products online, they must first understand what kinds of people they will find online and how those people behave in the online marketplace. In this section, we focus primarily on individual consumers in the business-to-consumer (B2C) arena. However, many of the factors discussed apply to the B2B arena as well, insofar as purchasing decisions by firms are made by individuals. We cover B2B marketing in more depth in Chapter 12.

THE ONLINE CONSUMER PROFILE

We will start with an analysis of some basic background demographics of online consumers in the United States. The first principle of marketing and sales is "know thy customer." Who is online, who shops online and why, and what do they buy? In 2022, around 300 million people of all ages had access to the Internet. Worldwide, about 4.5 billion people are online (Insider Intelligence/eMarketer, 2022a, 2022b).

Although the number of new U.S. online users increased at a rate of 30% a year or higher in the early 2000s, since then, the growth rate has significantly slowed, and in 2022, is only expected to be around 1%. E-commerce businesses can no longer count on a double-digit growth rate in the online population to fuel their revenues. The days of rapid growth in the U.S. Internet population are over.

Intensity and Scope of Usage

The slowing rate of growth in the U.S. Internet population is compensated for, in part, by an increasing intensity and scope of use. In 2022, about 90% of the U.S. population regularly uses the Internet, spending about eight and a quarter hours a day to engage in various activities (Insider Intelligence/eMarketer, 2022a, 2022c). Around 260 million people watch videos, around 240 million shop, around 220 million visit a social network or listen to various types of digital audio such as music or podcasts, around 180 million play digital games, and millions spend time just browsing the Web. Internet use by those in Gen Z (born between 1997 and 2012) is pervasive, with more than 93% regularly accessing the Internet and almost 80% using a mobile device to do so. (Insider Intelligence/eMarketer, 2021a). Smartphones and tablets are major access points to the Internet. Around 280 million people, about 93% of all U.S. Internet users, access the Internet using a mobile device (Insider Intelligence/eMarketer, 2022d). Owners of mobile devices spend about four and a half hours a day using them for non-telephone

activities such as viewing videos, visiting social networks, and playing games (Insider Intelligence/eMarketer, 2022c).

Demographics and Access

The demographic profile of the Internet—and e-commerce—has changed greatly over time. Up until 2000, White, young, college-educated males with high incomes dominated Internet usage. However, in recent years, there has been a marked increase in Internet usage by females, people of color, older adults, and families with modest incomes, resulting in a notable decrease—but not elimination—in the earlier inequality of access and usage.

A roughly equal percentage of men (89.8%) and women (88.7%) in the United States use the Internet today. Women comprise 50.4% of U.S. Internet users, with men at 49.6%. Young adults (18–24) form the age group with the highest percentage of Internet use, at more than 99%, followed closely by teens (12–17), at 98%. Adults in the 25–54 age groups are also strongly represented, each with percentages of 94% or higher. Another quickly growing group online is the 65 and over segment, more than 75% of whom now use the Internet. The percentage of very young children (0–11 years) online has also spurted, to about 73% of that age group. Future Internet user growth in the United States is likely to come predominantly from those aged 65 and older (Insider Intelligence/eMarketer, 2022a).

Variation across racial and ethnic groups is not as wide as it is across age groups. Ten years ago, there were significant differences among such groups in the United States, but this has receded. For instance, in 2022, 90% of White individuals use the Internet compared to 88% of Black individuals and 86% of Hispanic individuals. About 95% of households with income levels of $125,000 or above use the Internet, compared to only 77% of households earning less than $30,000. Over time, income differences have declined, but they remain significant, with an 18% gap between the highest category of household income and the lowest. Amount of education also makes a significant difference when it comes to Internet usage. Of the U.S. adults with a high school education or less, only about 75% go online, compared to 98% with a college degree or higher. Even some college education boosted Internet usage, with that segment reaching almost 95%. Overall, the "digital divide" has indeed moderated, but it still persists along income, education, age, racial, and ethnic dimensions (Insider Intelligence/eMarketer, 2022a).

Sex, age, race, and ethnicity also impact online purchasing behavior. Women are slightly more likely to purchase online than men, although not significantly so. There is more disparity in terms of age. For example, almost 90% of those in the 25-to-34 age bracket buy online compared to only 75% of those between the ages of 55 and 64. People over 65 are even less likely to buy online, with only about 60% doing so. As with Internet usage, racial and ethnic disparities are not as pronounced as they used to be. About 78% of the White population ages 14 and above in the United States purchases online, compared to 75% of the Black population and 74% of the Hispanic population (Insider Intelligence/eMarketer, 2022e).

Type of Internet Connection: Broadband and Mobile Impacts

Although a great deal of progress has been made in reducing glaring gaps in access to the Internet, there are still inequalities in access to broadband service. As you learned in Chapter 3, the U.S. Federal Communications Commission (FCC) currently defines

broadband as providing a minimum speed of 25 Mbps for downloads and 3 Mbps for uploads. Although the FCC claims that around 70% of all U.S. households have access to fixed broadband that meets or exceeds the FCC's minimum requirements, other surveys have reported that the percentage is much lower. Research by the Pew Research Center, for instance, indicates that broadband adoption levels are significantly lower for adults 65 and older, for those with low levels of education, and for those with low household incomes. Rural residents, Blacks, and Hispanics are also less likely to have a home broadband connection. For marketers, the broadband audience offers unique opportunities and for the positioning of products especially suited for this more educated and affluent audience. It is also important to note that just because a household does not have fixed broadband access, it does not mean that household members do not use the Internet; they just do so either from another location, such as a library, or via a smartphone. Certain groups are particularly reliant on smartphones for online access: younger adults in the 18–29 age group, those with low household incomes and levels of education, and Hispanics (Federal Communications Commission, 2021; Pew Research Center, 2021).

Community Effects: Social Contagion in Social Networks

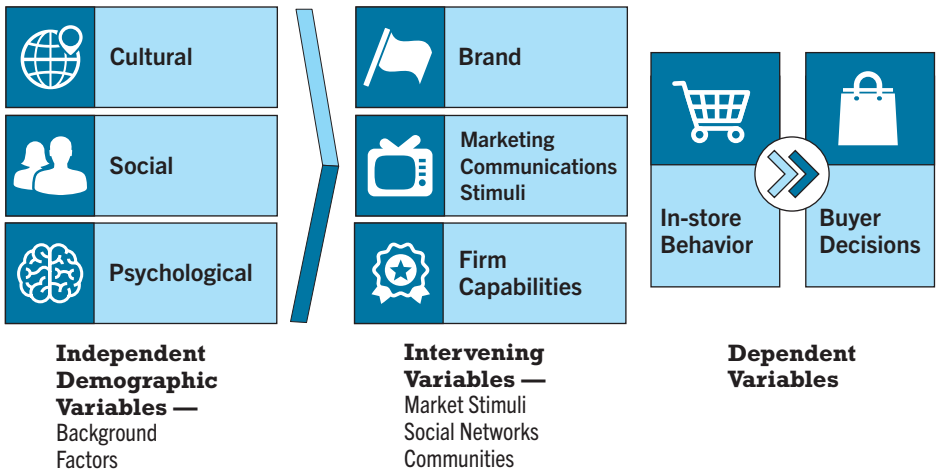
For a physical retail store, location is the most important factor in shaping sales. But for online retailers, physical location has almost no consequence. What does make a difference for online consumer purchases is whether the consumer is located in "neighborhoods" where others purchase on the Internet. These neighborhoods can be either face-to-face and truly personal, or digital. These so-called neighborhood effects, and the role of social emulation in consumption decisions, are well known for goods such as computers. In general, there is a relationship between being a member of a social network and purchasing decisions (Iyengar et al., 2009). About half (48%) of U.S. social network users have purchased an item either via a social network platform directly or by clicking a link through to the retailer's product page. Facebook is the social network most likely to drive customers to purchase, followed by Instagram and Pinterest. Social networks increase research online, followed by purchase offline (sometimes referred to as ROPO or webrooming), driving purchase traffic into physical stores where the product can be seen, tried, and then purchased. This is the opposite of the showrooming effect in which consumers shop in stores and then purchase online. The ROPO/webrooming effect has been found to be as large as the showrooming effect (Insider Intelligence/eMarketer, 2021b).

CONSUMER BEHAVIOR MODELS

Once firms have an understanding of who is online, they need to focus on how consumers behave online. The study of **consumer behavior** is a social science discipline that attempts to model and understand the behavior of humans in a marketplace. Several social science disciplines play roles in this study, including sociology, psychology, and economics. Models of consumer behavior attempt to predict or "explain" what consumers purchase and where, when, how much, and why they buy. The expectation is that if the consumer decision-making process can be understood, firms will have a much better idea of how to market and sell their products. **Figure 6.1** illustrates a general consumer behavior model that takes into account a wide range of factors that influence a consumer's marketplace decisions.

consumer behavior
a social science discipline that attempts to model and understand the behavior of humans in a marketplace

FIGURE 6.1 A GENERAL MODEL OF CONSUMER BEHAVIOR



Consumer behavior models try to predict the decisions that consumers make in the marketplace.
SOURCE: Based on Kotler and Armstrong, 2009.

Online consumer behavior parallels that of offline consumer behavior, with some obvious differences. It is important to first understand why people choose to purchase online rather than in a store. Although price is an important consideration, consumers also shop online because of convenience, which in turn is produced largely by saving them time. Overall transaction cost reduction is a major motivator for choosing the online channel.

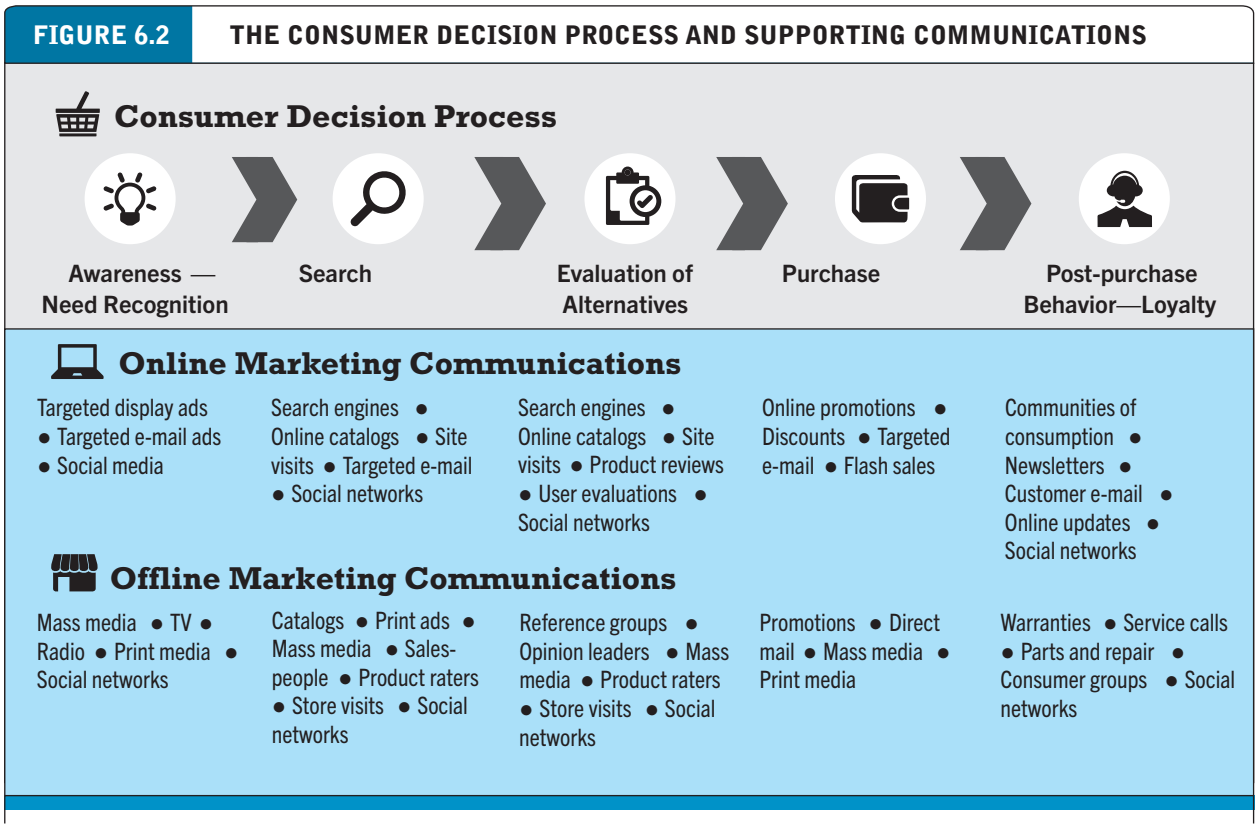
THE ONLINE PURCHASING DECISION

Once online, why do consumers actually purchase a product or service from a specific vendor? Among the most important reasons are price and the availability of free shipping. That the seller is someone whom the purchaser trusts is also a very important factor.

You also need to consider the process that buyers follow when making a purchase decision and how the online environment affects consumers' decisions. There are five stages in the consumer decision process: awareness of need, search for more information, evaluation of alternatives, the actual purchase decision, and post-purchase contact with the firm. **Figure 6.2** shows the consumer decision process and the types of offline and online marketing communications that support this process and seek to influence the consumer before, during, and after the purchase decision.

The stages of the consumer decision process are basically the same whether the consumer is offline or online. On the other hand, the general model of consumer behavior requires modification to take into account the unique features of e-commerce that allow different opportunities to interact with the customer online. In **Figure 6.3** on page 324, we have modified the general model of consumer behavior to focus on user

FIGURE 6.2 THE CONSUMER DECISION PROCESS AND SUPPORTING COMMUNICATIONS



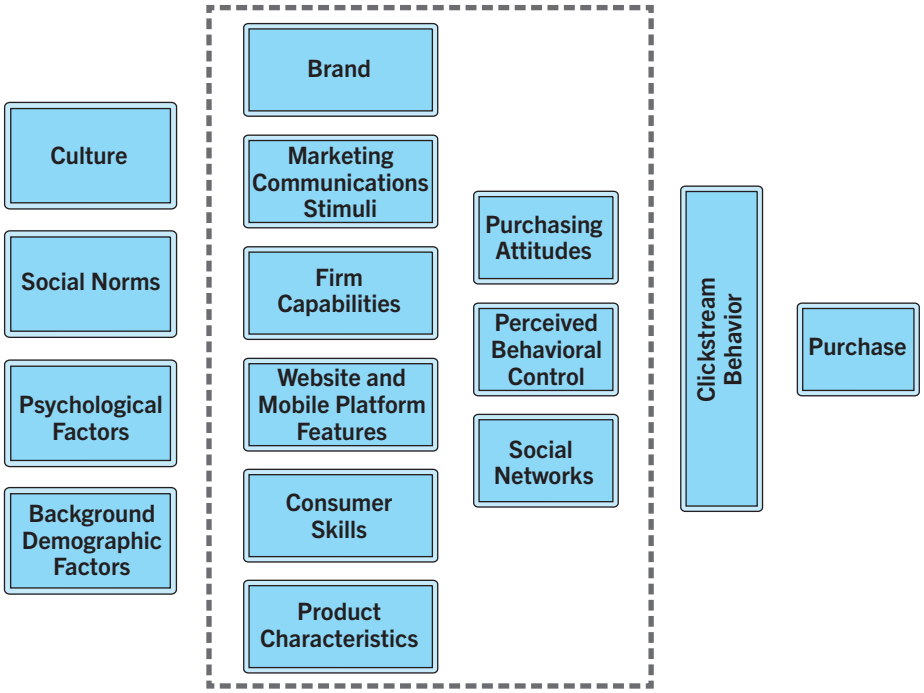
characteristics, product characteristics, and website and mobile platform features, along with traditional factors such as brand strength and specific market communications (advertising) and the influence of both online and offline social networks.

In the online model, website and mobile platform features, along with consumer skills, product characteristics, attitudes toward online purchasing, and perceptions about control over the online environment come to the fore. Website and mobile platform features include latency (delay in downloads), navigability, and confidence in online security. There are parallels in the analog world. For instance, it is well known that consumer behavior can be influenced by store design and that understanding the precise movements of consumers through a physical store can enhance sales if goods and promotions are arranged along the most likely consumer tracks. Consumer skills refers to the knowledge that consumers have about how to conduct online transactions (which increases with experience). Product characteristics refers to the fact that some products can be easily described, packaged, and shipped online, whereas others cannot. Combined with traditional factors, such as brand, advertising, and firm capabilities, these factors lead to specific attitudes about purchasing from an e-commerce firm (trust in the firm and favorable customer experience) and a sense that consumers can control their environment online.

clickstream behavior the digital trail that consumers establish as they move about the Web

Clickstream behavior refers to the digital trail that consumers establish as they move about the Web, from search engine to a variety of sites, then to a single site, then to

FIGURE 6.3 A MODEL OF ONLINE CONSUMER BEHAVIOR



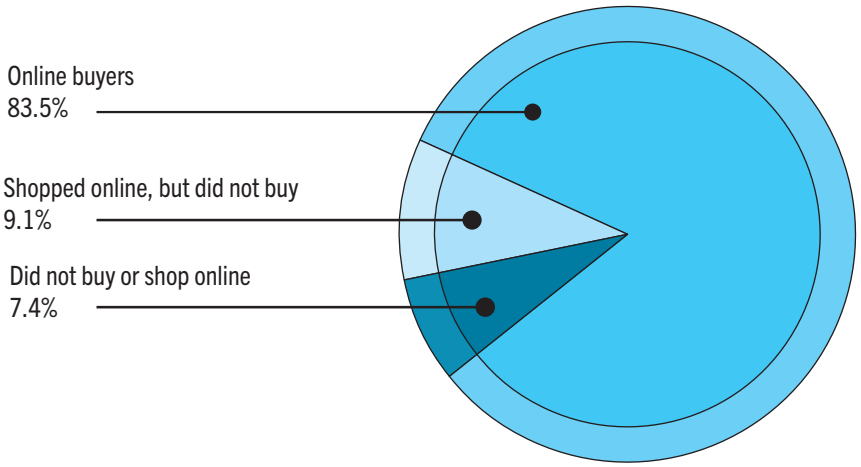
In this general model of online consumer behavior, the decision to purchase is shaped by background demographic factors and several intervening factors, and, finally, is influenced greatly by clickstream behavior very near to the precise moment of purchase.

a single page, and then, finally, to a decision to purchase. These precious moments are similar to "point-of-purchase" moments in traditional retail. Detailed and general clickstream behavior are as important as customer demographics and prior purchase behavior in predicting a current purchase. Clickstream marketing takes maximum advantage of the Internet environment. It presupposes no prior "deep" knowledge of the customer (and in that sense is "privacy-regarding") and can be developed dynamically as customers use the Internet. For instance, the success of search engine marketing (the display of paid advertisements by search engines) is based in large part on what the consumer is looking for at the moment and how they go about looking (detailed clickstream data). After examining the detailed data, general clickstream data is used (days since last visit, past purchases). If available, demographic data (such as age, sex, and location) is used.

SHOPPERS: BROWSERS AND BUYERS

The picture of Internet use sketched in the previous section emphasizes the complexity of behavior online. Although the Internet audience was at one time concentrated among the well-educated, affluent, and youthful, the audience is increasingly becoming more diverse. Clickstream analysis shows us that people go online for many different reasons. Online shopping is similarly complex. Beneath the surface of the $1.3 trillion B2C e-commerce market in 2022 are substantial differences in how users shop online.

FIGURE 6.4 ONLINE SHOPPERS AND BUYERS



More than 92.5% of U.S. Internet users, ages 14 and older, shop online, either by purchasing or researching products online. The percentage of those actually purchasing has increased to 83.5%. Only 7.4% do not buy or shop online.

SOURCE: Based on data from Insider Intelligence/eMarketer, 2022e.

For instance, as shown in **Figure 6.4**, 83.5% of U.S. Internet users, ages 14 and older, are "buyers" who purchase something online. Another 9% research products online ("shoppers") but purchase them offline. The number of online shoppers (the combination of buyers and browsers) adds up to a market size of almost 240 million consumers. Most marketers find this number exciting (Insider Intelligence/eMarketer, 2022e).

The significance of online browsing for offline purchasing should not be underestimated. Although it is difficult to precisely measure the amount of offline sales that occur because of online product research, Forrester Research estimates that nearly two-thirds (62%) of all U.S. retail sales are now digitally influenced, up from 49% prior to the Covid-19 pandemic (Vail, 2021).

E-commerce is a major conduit and generator of offline commerce. The reverse is also true: Online traffic is driven by offline brands and shopping. Although online research influences offline purchases, it is also the case that offline marketing media heavily influences online behavior, including sales. Traditional print media (magazines and newspapers) and television remain powerful media for reaching and engaging consumers with information about new products and directing them to the Web.

Social networks are also very influential but not yet as powerful as traditional media. This may be surprising to many given the attention to social networks as marketing vehicles, but it reflects the diversity of influences on consumer behavior.

These considerations strongly suggest that e-commerce and traditional commerce are coupled and should be viewed as part of a continuum of consuming behavior and not as radical alternatives to one another. Commerce is commerce; the customers are often the same people. Customers use a wide variety of media, sometimes multiple media at once. The significance of these findings for marketers is very clear. Online merchants

should create content on their sites to attract browsers looking for information, create content that ranks high in search engines, put less attention on selling per se, and promote services and products (especially new products) in offline media settings in order to support their online stores.

INTENTIONAL ACTS: HOW SHOPPERS FIND VENDORS ONLINE

Given the prevalence of "click here" display ads, one might think customers are "driven" to online vendors by spur-of-the-moment decisions. In fact, only a tiny percentage of shoppers click on display ads to find vendors. E-commerce shoppers are highly intentional. Typically, they are focused browsers looking for specific products, companies, and services. Once they are online, a majority of consumers use a search engine as their preferred method of research for purchasing a product. Many will go directly to an online marketplace, such as Amazon or eBay, and some will go directly to a specific retail website. Merchants can convert these "goal-oriented," intentional shoppers into buyers if the merchants can target their communications to the shoppers and design their sites and apps in such a way as to provide easy-to-access and useful product information, full selection, and customer service and do so at the very moment the customer is searching for the product. This is no small task.

WHY SOME PEOPLE DON'T SHOP ONLINE: TRUST, UTILITY, AND OPPORTUNISM IN ONLINE MARKETS

About 7.4% of Internet users do not shop or buy online. Why not? One of the most important factors cited by those who don't shop or buy online is the "trust factor," the fear that online merchants will cheat you, lose your credit card information, or use the personal information that you give them to invade your personal privacy, bombarding you with unwanted e-mail and pop-up ads. Secondary factors can be summarized as "hassle factors," like shipping costs, returns, and inability to touch and feel the product.

A long tradition of research shows that the two most important factors shaping the decision to purchase online are utility and trust. Consumers want good deals, bargains, convenience, and speed of delivery. In short, consumers are looking for utility. On the other hand, in any seller-buyer relationship, there is an asymmetry of information. The seller usually knows a lot more than the consumer about the quality of goods and terms of sale. This can lead to opportunistic behavior by sellers. Consumers need to trust a merchant and marketplace platform before they make a purchase. Merchants can develop trust among online consumers by building strong reputations of honesty, fairness, and delivery of quality products—the basic elements of a brand. Platforms need to assure users that the platform will protect both the security and the privacy of the user's data. Online recommendations from previous purchasers and feedback forums are examples of trust-building online mechanisms. Online sellers who develop trust among consumers can charge a premium price for their online products and services. A review of the literature suggests that the most important factors leading to a trusting online relationship are perception of website credibility, ease of use, and perceived risk. Although concerns about trust in the online environment have lessened over time, lack of trust remains an important brake on the growth of e-commerce in general and on social e-commerce in particular (Insider Intelligence/eMarketer, 2021b).

6.2 DIGITAL COMMERCE MARKETING AND ADVERTISING STRATEGIES AND TOOLS

Online marketing has many similarities to, and differences from, ordinary marketing The objective of online marketing—as in all marketing—is to build customer relationships so that the firm can achieve above-average returns (both by offering superior products or services and by communicating the brand's features to the consumer). These relationships are a foundation of the firm's brand. But online marketing is also very different from ordinary marketing because the nature of the medium and its capabilities are so different from anything that has come before.

There are four primary features of online marketing that distinguish it from traditional marketing channels. Compared to traditional print and television marketing, online marketing can be more personalized, participatory, peer-to-peer, and communal. Not all types of online marketing have these four features. For instance, there's not much difference between a marketing video splashed across your screen and a television commercial. However, the same marketing video can be targeted to your personal interests and community memberships and can allow you to share it with others. Marketers are learning that the most effective forms of online marketing have all four of these features.

STRATEGIC ISSUES AND QUESTIONS

In the past, the first step in building an online brand was to build a website and then try to attract an audience. The most common "traditional" marketing techniques for establishing a brand and attracting customers were search engine marketing, display ads, e-mail campaigns, and affiliate programs. This is still the case: Building a website is usually still a first step, and the "traditional" online marketing techniques are still the main powerhouses of brand creation and online sales revenue. But today, marketers need to take a much broader view of the online marketing challenge and to consider other media channels for attracting an audience, such as social media and mobile devices in concert with traditional websites.

The five main elements of a comprehensive multi-channel marketing plan are: website, traditional online marketing, social marketing, mobile marketing, and offline marketing. **Table 6.2** illustrates these five main platforms, central elements within each type, some examples, and the primary function of marketing in each situation. Each of the main types of online marketing is discussed in this section and throughout the chapter in greater detail.

Table 6.2 illustrates the complexity of building brands online. There are five major types of marketing and a variety of different platforms that perform different functions. If you're a manager of a startup or the website manager of an existing commercial website, you face a number of strategic questions. Where should you focus first? Build a website, develop a blog, or jump into developing a Facebook presence? If you have a successful website that already uses search engine marketing and display ads, where should you go next: develop a social network presence or use offline media? Does your firm have the resources to maintain a social media marketing campaign?

TABLE 6.2 THE DIGITAL MARKETING ROADMAP

TYPE OF MARKETING	PLATFORMS/ TOOLS	EXAMPLES	FUNCTION
Website	Traditional website	Ford.com	Anchor site
Traditional Online Marketing	Search engine marketing	Google	Query-based intention marketing
	Display advertising	Yahoo; Google; publisher websites	Interest- and context-based marketing; targeted marketing
	E-mail	Major retailers	Permission marketing
	Affiliates	Amazon	Brand extension
Social Marketing	Social networks	Facebook	Conversations; branding; sharing; influencing
	Blogs/forums	Tumblr	Communities of interest; sharing; influencing
	Visual marketing	Pinterest; Instagram	Branding; engagement; sharing; influencing
	Video marketing	YouTube	Branding; engagement; sharing; influencing
	Game, metaverse, and NFT marketing	Coca-Cola "Friendship Day Loot Box"	Branding; engagement
Mobile Marketing	Mobile site	Ford.com	Mobile access to anchor site
	Apps	Walmart	Seamless customer experience; full-fledged alternative to website
Offline Marketing	Television	Apple/Shot on iPhone	Brand anchoring
	Newspapers	American Airlines/The World's Greatest Flyers Fly American	Brand anchoring
	Magazines	Apple Watch/*Vogue* Magazine	Brand anchoring

A second strategic management issue involves the integration of all these different marketing platforms into a single, coherent branding message. Often, there are different groups with different skill sets involved in website design, search engine and display marketing, social media marketing, and offline marketing. Getting all these different specialties to work together and coordinate their campaigns can be very difficult. One danger is that a firm ends up with different teams managing each of the platforms rather than a single team managing the digital online presence or, for that matter, marketing for the entire firm including retail outlets.

A third strategic management question involves resource allocation. There are actually two problems here. Each of the different major types of marketing, and each of the different platforms, has different metrics to measure its effectiveness. For instance, in social marketing, engagement level (as evidenced by follows, reactions and shares) is an important metric. In search engine marketing, effectiveness is measured by how many clicks your ads are receiving; in display advertising, by how many impressions of your ads are served. Second, each of these platforms has different costs. In order to choose where your marketing resources should be deployed, you will have to link each of these activities to sales revenue and determine how much they are worth. We address these questions in greater detail later in this chapter and in Chapter 7.

THE WEBSITE AS A MARKETING PLATFORM: ESTABLISHING THE CUSTOMER RELATIONSHIP

A firm's website is a major tool for establishing the initial relationship with the customer. The website performs four important functions: establishing the brand identity and consumer expectations, informing and educating the consumer, shaping the customer experience, and anchoring the brand in an ocean of marketing messages coming from different sources. The website is the one place where the consumer can turn to find the complete story. This is not true of apps, e-mail, or search engine ads.

The first function of a website is to establish the brand's identity and to act as an anchor for the firm's other marketing activities, thereby driving sales revenue. This involves identifying for the consumer the differentiating features of the product or service in terms of quality, price, product support, and reliability. Identifying the differentiating features of the product on the website's home page is intended to create expectations in the user of what it will be like to consume the product. For instance, Snapple's website creates the expectation that the product is a delicious, refreshing drink made from high-quality, natural ingredients. Ford's website focuses on automobile technology and fuel efficiency. The expectation created by Ford's website is that if you buy a Ford, you'll be experiencing the latest automotive technology and the most fuel-efficient vehicle.

Websites also function to anchor the brand online, acting as a central point where all the branding messages that emanate from the firm's multiple digital presences, such as Facebook, Instagram, TikTok, Twitter, mobile apps, or e-mail, come together at a single online location. Aside from branding, websites perform the typical functions of any commercial establishment by informing customers of the company's products and services. Websites, with their online catalogs and associated shopping carts, are important elements of the online customer experience. **Customer experience** refers to the totality of experiences that a customer has with a firm, including the search, information about, purchase, consumption, and after-sales support for the product. The concept "customer experience" is broader than the traditional concept of "customer satisfaction" in that a much broader range of impacts is considered, including the customer's cognitive, affective, emotional, social, and physical relationship to the firm and its products. The totality of customer experiences will generally involve multiple channels. This means that, in customers' minds, the website, mobile site and apps, Facebook page, Instagram feed, Twitter stream, physical store, and television advertisements are all connected as part of their experience with the company.

customer experience the totality of experiences that a customer has with a firm, including the search, information about, purchase, consumption, and after-sales support for its products, services, and various retail channels

TRADITIONAL ONLINE MARKETING AND ADVERTISING TOOLS

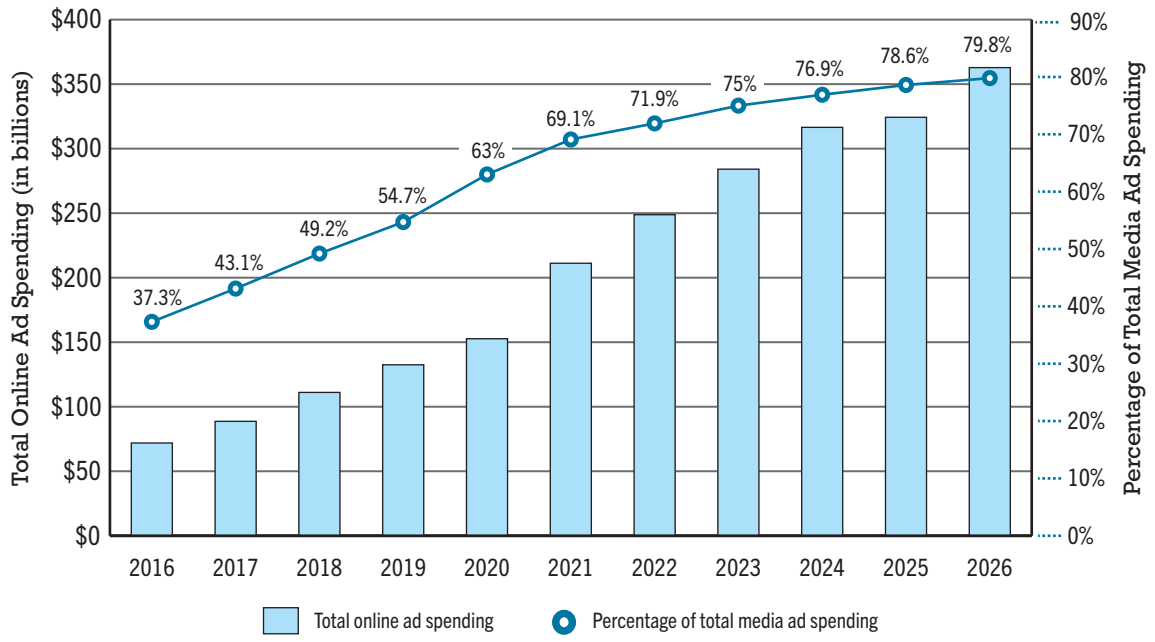
In this section, we describe the basic marketing and advertising tools for attracting e-commerce consumers: search engine marketing, display ad marketing (including banner ads, rich media ads, video ads, and sponsorships), e-mail marketing, affiliate marketing, and lead generation marketing.

online advertising
a paid message on a website, app, or other digital medium

Companies will spend an estimated $345 billion on advertising in 2022. An estimated $250 billion of that amount is expected to be spent on **online advertising** (paid messages on a website, app, or other digital medium). Online advertising includes display ads (banners, video, rich media, and sponsorships), search ads, classifieds, lead generation, and e-mail, on desktop and laptop computers as well as on mobile devices and connected TVs. The percentage that online advertising comprises of total media advertising has been rapidly growing, almost doubling from 37% in 2016 to more than 70% in 2022. By 2026, online advertising is expected to account for almost 80% of all advertising spending (see **Figure 6.5**). The top three digital advertising platforms in terms of U.S. estimated ad revenues in 2022 are Google/YouTube (about $78 billion), Meta (Facebook/Instagram) (about $55 billion), and Amazon (about $31 billion) (Insider Intelligence/eMarketer, 2022f, 2022g, 2022h).

In the last five years, advertisers have aggressively increased online spending and cut outlays on traditional channels. By 2016, for the first time, the amount spent on

FIGURE 6.5 ONLINE ADVERTISING SPENDING



Spending on online advertising is expected to grow to more than $360 billion by 2026, at which point it is expected to comprise almost 80% of total media ad spending.

SOURCE: Based on data from Insider Intelligence/eMarketer, 2022g.

TABLE 6.3 ONLINE ADVERTISING SPENDING FOR SELECTED FORMATS (IN BILLIONS)

FORMAT	2022	2026	AVERAGE ANNUAL GROWTH RATE
Search	$99	$136.3	9.6%
Banner ads	$52.3	$68.3	9.3%
Video	$76.2	$116.6	16%
Rich media	$11.1	$18.6	15%
Sponsorships	$4	$4.4	3.7%
Lead generation	$3	$3.5	4.3%
Classifieds	$2.4	$2.5	1.0%
E-mail	$0.59	$0.73	6.4%

SOURCE: Based on data from Insider Intelligence/eMarketer, 2022g.

online advertising exceeded the amount spent on television advertising, and by 2026, television advertising is expected to account for less than 15% of total ad spending (Insider Intelligence/eMarketer, 2022f).

Table 6.3 provides some comparative data on the amount of spending for certain advertising formats. In 2022, the highest amount of spending is expected to be for paid search, followed by video ads.

Online advertising has both advantages and disadvantages when compared to advertising in traditional media, such as television, radio, and print (magazines and newspapers). One big advantage for online advertising is that the Internet is where the audience has moved, especially the very desirable 18–34 age group. A second big advantage for online advertising is the ability to target ads to individuals and small groups and to track performance of advertisements in almost real time. **Ad targeting**, the sending of marketing messages to specific subgroups in the population in an effort to increase the likelihood of a purchase, is as old as advertising itself, but prior to the Internet, it could only be done with much less precision, certainly not down to the level of individuals. Ad targeting is also the foundation of price discrimination: the ability to charge different types of consumers different prices for the same product or service.

ad targeting the sending of marketing messages to specific subgroups in the population

Theoretically, online advertising can personalize every ad message to precisely fit the needs, interests, and values of each consumer. In practice, as we all know from spam and constant exposure to ads that are of little interest, the reality is very different. Online advertisements also provide greater opportunities for interactivity—two-way communication between advertisers and potential customers. The primary disadvantages of online advertising are concerns about its cost versus its benefits, how to adequately

measure its results, and the supply of good venues in which to display ads. For instance, the owners of websites who sell advertising space ("publishers") do not have agreed-upon standards or routine audits to verify their claimed numbers as do traditional media outlets. We examine the costs and benefits of online advertising as well as research on its effectiveness in Section 6.4.

Search Engine Marketing and Advertising

In 2022, companies are expected to spend an estimated $99 billion on search engine marketing and advertising, about 40% of all spending for digital marketing. Around 260 million U.S. Internet users (about 85% of all U.S. Internet users) use a search engine at least once a month, and users type in an estimated 2.4 million queries every minute of every day (Insider Intelligence/eMarketer, 2022g, 2022i; Wise, 2022). Briefly, this is where the eyeballs are (at least for a few moments), and this is where advertising can be very effective by responding with ads that match the interests and intentions of the user. The click-through rate for search engine advertising is generally 1%–4% (with an average of around 2%) and has been fairly steady over the years (Montti, 2021). The top three search engine providers (Google, Microsoft/Bing, and Yahoo/AOL) supply more than 95% of all online searches. However, Amazon has become increasingly more important as a starting point for consumers searching for products. **Search engine marketing (SEM)** refers to the use of search engines to build and sustain brands. **Search engine advertising** refers to the use of search engines to support direct sales to online consumers.

search engine marketing (SEM)
the use of search engines to build and sustain brands

search engine advertising
the use of search engines to support direct sales to online consumers

Search engines are often thought of as mostly direct sales channels focused on making sales in response to advertisements. Although this is a major use of search engines, they are also used more subtly to strengthen brand awareness, to drive traffic to other websites or blogs to support customer engagement, to gain deeper insight into customers' perceptions of the brand, to support other related advertising (for instance, sending consumers to local dealer sites), and to support the brand indirectly. Search engines can also provide marketers insight into customer search patterns, opinions customers hold about their products, top trending search keywords, and what their competitors are using as keywords and the customer response. For example, PepsiCo, home of mega brands like Pepsi and Doritos, does not directly sell its products online, but a search on Pepsi will link to a branding websites aimed at consumers, investors, and shareholders. The focus is on building, sustaining, and updating the PepsiCo collection of branded consumer goods.

organic search
inclusion and ranking of websites based on a more or less unbiased application of a set of rules imposed by the search engine

pay-per-click (PPC) search ad
primary type of search engine advertising

keyword advertising
merchants purchase keywords through a bidding process at search engines, and whenever a consumer searches for that word, their advertisement shows up somewhere on the page

Types of Search Engine Advertising Search engines originally performed unbiased searches of the Web's huge collection of web pages and derived most of their revenue from banner advertisements. This form of search engine results is often called **organic search** because the inclusion and ranking of websites are based on a more or less "unbiased" application of a set of rules (an algorithm) imposed by the search engine.

Today, **pay-per-click (PPC) search ads** are the primary type of search engine advertising. In **keyword advertising**, merchants purchase keywords through a bidding process at search engines, and whenever a consumer searches for that word, their advertisement shows up somewhere on the page, usually as a small text-based advertisement on the right but also as a listing on the very top of the page. The more merchants pay, the higher the rank and greater the visibility of their ads on the page. Generally, search engines do not exercise editorial judgment about the quality or content of the ads,

although they do monitor the use of language. In addition, some search engines rank the ads in terms of their popularity rather than merely the money paid by the advertiser so that the rank of the ad depends on both the amount paid and the number of clicks per unit of time. Google's keyword advertising program is called Google Ads (formerly AdWords).

Google's **AdSense** program differs from the ordinary keyword advertising described previously. Publishers (websites that want to show ads) allow Google to place "relevant" ads on their sites. The ads are paid for by advertisers who want their messages to appear on various sites across the Web. The revenue from the resulting clicks is split between Google and the site publisher, although the publisher gets much more than half in some cases.

AdSense
publishers accept ads placed by Google on their websites and receive a fee for any click-throughs from those ads

Search engine advertising is nearly an ideal targeted marketing technique: At precisely the moment that a consumer is looking for a product, an advertisement for that product is presented. Consumers benefit from search engine advertising because ads for merchants appear only when consumers are looking for a specific product. Thus, search engine advertising saves consumers cognitive energy and reduces search costs (including the cost of transportation needed to do physical searches for products).

Because search engine marketing can be very effective, companies optimize their websites for search engine recognition. The better optimized the page is, the higher a ranking it will achieve in search engine result listings, and the more likely it will appear on the top of the page in search engine results. **Search engine optimization (SEO)** is the process of improving the ranking of web pages with search engines by altering the content and design of the web pages and site. By carefully selecting keywords used on the web pages, updating content frequently, and designing the site so that it can be easily read by search engine programs, marketers can improve the impact and return on investment in their web marketing programs. SEO is particularly important because Google and other search engine firms make frequent changes to their search algorithms to improve search results and user experience. Google, for instance, reportedly makes more than 600 search engine algorithm changes in a year (Moz.com, 2022).

search engine optimization (SEO)
techniques to improve the ranking of web pages generated by search engine algorithms

Visual Search and Voice Search Visual search and voice search are two emerging trends that are likely to impact search marketing in the future. **Visual search** uses artificial intelligence technologies, such as machine learning and computer vision, to help people search for information based on visual images rather than through text search. Examples include Google Lens, a feature within Google Image Search that is now being used for 8 billion visual searches a month; Pinterest Lens; and Snap Scan. Visual search is expected to have a big impact on e-commerce marketing, with more than 50% of U.S. Internet users in a recent survey stating that it was the technology they were most excited about being able to use as part of their shopping experience (Boland, 2022; Mohanadasan, 2020; Visenze, 2020). **Voice search** uses artificial intelligence technologies such as natural language processing to help people to search for information through spoken voice commands rather than through typing. Currently, most people use voice search primarily for informational purposes, but the number of people using voice search to perform product searches or to search for product reviews is increasing. Connected cars (see the opening case in Chapter 2) are another platform for voice search. For example, Toyota and Lexus recently partnered with Cerence to deploy its Browse voice search engine in their cars (Insider Intelligence/eMarketer, 2022j).

visual search
uses artificial intelligence technologies, such as machine learning and computer vision, to help people search for information based on visual images rather than through text search

voice search
uses artificial intelligence technologies such as natural language processing to help people search for information through spoken voice commands rather than through typing

Search Engine Advertising Issues Although search engines have provided significant benefits to merchants and customers, they also present risks and costs. For instance, search engines have the power to crush a small business by placing its ads on the back pages of search results. Merchants are at the mercy of search engines for access to the online marketplace, and this access is dominated by a single firm, Google. How Google decides to rank one company over another in search results is not known. No one really knows how to improve in its rankings (although there are hundreds of firms who claim otherwise). Google editors intervene in unknown ways to punish certain websites and reward others. Using paid sponsored listings, as opposed to relying on organic search results, eliminates some, but not all, of this uncertainty.

click fraud
occurs when a competitor clicks on search engine results and ads, forcing the advertiser to pay for the click even though the click is not legitimate

content farms
companies that generate large volumes of textual content for multiple websites designed to attract visitors and search engines

link farms
groups of websites that link to one another, thereby boosting their ranking in search engines

Other practices that degrade the results and usefulness of search engines include:

- **Click fraud** occurs when a competitor clicks on search engine results and ads, forcing the advertiser to pay for the click even though the click is not legitimate. Competitors can hire firms to perform fraudulent clicks or hire botnets to automate the process. Click fraud can quickly run up a large bill for merchants, without resulting in any growth in sales.
- **Content farms** are companies that generate large volumes of textual content for multiple websites designed to attract viewers and search engines. Content farms profit by attracting large numbers of visitors to their sites and exposing them to ads. The content typically is not original but is copied or summarized from legitimate content sites.
- **Link farms** are groups of websites that link to one another, thereby boosting their ranking in search engines that use a page ranking algorithm to judge the "usefulness" of a website. Google considers link farming to be a manipulative tactic and places a heavy ranking penalty on websites that use such tactics (Hilson, 2022).

Display Ad Marketing

display ads
include banner ads, rich media ads, video ads, sponsorships, native advertising, and content marketing

In 2022, companies are expected to spend around $145 billion on all forms of display ad marketing, almost 58% of all spending for digital marketing. **Display ads** include a number of different types of ads, including banner ads, rich media ads, and video ads. Sponsorships and native advertising are also considered types of display ad marketing. Trillions of display ads are served annually on desktop and mobile devices. The top three display ad companies in 2022 are Meta (Facebook/Instagram), Google, and Amazon, which together account for more than 55% of U.S. display ad revenue (Insider Intelligence/eMarketer, 2022k). The Interactive Advertising Bureau (IAB), an industry organization, has established voluntary industry guidelines for display ads. Publishers are not required to use these guidelines, but many do. The guidelines are based on HTML5 technology and cover all types of display ads as well as new ad experiences such as augmented reality, virtual reality, 360-degree ads, and emoji ads, among others. Another important aspect of the guidelines is their incorporation of LEAN principles. LEAN is an acronym that stands for lightweight, encrypted, AdChoices-supported, and non-invasive advertising. In an attempt to enhance consumer acceptance of advertising, the standard contains guidelines with respect to animations, ad expansions, close buttons, user initiation, interstitials (ads that appear before, in-between, or after the primary content), video and auto-play video and audio, as well as a list of disruptive ad

experiences that are no longer permitted, such as pop-up ads (ads that overlay or cover the content after the user has started viewing the content), auto expansion (ads that expand without user initiation), auto-play video with audio, and flashing animations (IAB Technology Lab, 2022).

Banner Ads Ads are the oldest and most familiar form of display marketing. They are also the least-effective and the lowest-cost form of online marketing. A **banner ad** displays a promotional message in a rectangular box on the screen of a desktop/laptop computer or mobile device. A banner ad is similar to a traditional ad in a printed publication but has some added advantages. When clicked, it brings potential customers directly to the advertiser's website, and the site where the ad appears can track the user's behavior on the site. The ability to identify and track the user is a key feature of online advertising. Banner ads often feature video and other animations. It's important to note that although the terms banner ad and display ad are often used interchangeably, banner ads are just one form of display ad. Despite their limited effectiveness, advertisers are expected to spend about $52 billion on banner ads in 2022, about 36% of all spending on display ads and 21% of total online ad spending (Insider Intelligence/eMarketer, 2022g).

banner ad
displays a promotional message in a rectangular box on the screen of a desktop/laptop computer or mobile device

Rich Media Ads Ads that employ interactive features that engage the user—such as animations (moving graphics); elements that trigger new content experiences, such as ad expansion, where the ad expands to a size bigger than its original size; or video play—are referred to as **rich media ads**. Rich media ads are expected to account for about $11 billion in online advertising expenditures (about 4% of total online advertising) in 2022. They are more effective than simple banner ads (Insider Intelligence/eMarketer, 2022g).

rich media ad
ad employing interactive features that engage the user

Video Ads Online **video ads** are TV-like advertisements that appear as in-page video commercials before, during, or after a variety of content. **Table 6.4** describes some of the different types of video ads. The most widely used are in-stream video advertisements that display before (pre-roll), during (mid-roll), or at the end of (post-roll) a video that a user has clicked on.

video ad
TV-like advertisement that appears as an in-page video commercial before, during, or after content

TABLE 6.4 TYPES OF VIDEO ADS

FORMAT	DESCRIPTION	WHEN USED
Linear video ad	Pre-roll; takeover; ad takes over video for a certain period of time	Before, between, or after video
Nonlinear video ad	Overlay; ad runs at same time as video content and does not take over full screen	During, over, or within video
In-banner video ad	Rich media; ad is triggered within banner, may expand outside banner	Within web page, generally surrounded by content
In-text video ad	Rich media; ad is delivered when user mouses over relevant text	Within web page, identified as a highlighted word within relevant content

The amount spent on online video ads is second only to the amount spent on search engine advertising. Video ads are expected to be the fastest-growing form of online advertisement over the next five years. In 2022, they are expected to account for about $76 billion in online advertising spending, and that amount is expected to increase to about $125 billion by 2026. The rapid growth in video ads is due in part to the fact that video ads are far more effective than other display ad formats (Insider Intelligence/eMarketer, 2022g).

There are many specialized video advertising networks that run video advertising campaigns for national advertisers and place these videos on their respective networks of websites. Firms can also establish their own video sites to promote their products. Online retailers are among the largest users of advertising videos.

sponsorship
a paid effort to tie an advertiser's name to information, an event, or a venue in a way that reinforces its brand in a positive yet not overtly commercial manner

Sponsorships A **sponsorship** is a paid effort to tie an advertiser's name to particular information, an event, or a venue in a way that reinforces its brand in a positive yet not overtly commercial manner. In 2022, companies are expected to spend about $4 billion for sponsorship marketing (Insider Intelligence/eMarketer, 2022g). Sponsorships typically are more about branding than about immediate sales. A common form of sponsorship is targeted content (or advertorials), in which editorial content is combined with an ad message to make the message more valuable and attractive to its intended audience. For instance, WebMD, the leading medical information website in the United States, displays sponsored pages on the WebMD website from companies such as Phillips (to describe its home defibrillators) and Lilly (to describe its pharmaceutical solutions for attention deficit disorders among children). Social media sponsorships, in which marketers pay social media influencers for mentions in social media, such as blogs, tweets, or in online videos, are also a popular tactic (We discuss influencer marketing in more depth later in this chapter and in Chapter 7). Sponsorships have also moved onto the mobile platform. The line between sponsorship marketing and native advertising (discussed in the next section) is somewhat blurry.

native advertising
advertising that looks similar to editorial content

Native Advertising Advertising that looks similar to editorial content is known as **native advertising**. Native advertising is not new. Traditional native advertising includes television infomercials, newspaper advertorials, and entire sections of newspapers and magazines that are given over to advertisers, where the advertising looks similar to the rest of the publication. Typically, native ads mimic the editorial content around them and increasingly include video. They appear outside the normal or expected area for ads and are labeled to indicate that they are not editorial content, although in most cases the word "ad" is not used. On the Web or mobile screens, native ads are usually distinguished by a "sponsored" tag underneath the headline, often in a different color. Online native advertising is growing rapidly, especially on social networks. In 2022, native ad spending is expected to reach almost $88 billion (Insider Intelligence/eMarketer, 2021c).

In the online world, native ads are most often found on social networks, for instance, as part of a Facebook Feed or Instagram Story. In fact, almost all (more than 97%) of social network ad spending is native advertising. Mobile social networks, in particular, do not have room for ads on the right side of the screen (the sidebar or right rail), and therefore native ads in the form of posts that look like other posts are the favored option. Native advertising's share of mobile display ad revenues has skyrocketed from 14% in 2012 to more than 85% in 2021 (Insider Intelligence/eMarketer, 2021c).

Researchers have found that many online consumers cannot distinguish between editorial content and sponsored ads that look like editorial content. Many consumers skip over labels like "sponsored" or "promoted," and many do not understand the difference between paid and unpaid content. Yet market researchers have found that native ads are far more influential with consumers. Consumers look at native ads longer than they do banner ads and more frequently than they look at other types of display ads. Native ads also raise purchase intent, and consumers are more likely to share a native ad than a regular ad.

Native advertising is controversial. Critics contend that the purpose of native ads is to deceive or fool the consumer into thinking the ad has the same validity as editorial content (Amazeen, 2022). The Federal Trade Commission (FTC) has explicit rules for native ads. The FTC examines the entire ad, including factors such as its overall appearance, similarity of its style to editorial content on the site on which it appears, and the degree to which it is distinguishable from such content. Labels indicating the commercial nature of the content need to be prominently displayed upon the viewer's first contact with the content (Federal Trade Commission, 2015a, 2015b). However, compliance with the FTC's native advertising guidelines still remains problematic.

Content Marketing Native advertising is usually focused on partnering with a specific publisher. **Content marketing** creates a content campaign for a brand and then tries to secure placement on a variety of websites. Examples of content include articles, infographics, case studies, interactive graphics, white papers, and even traditional press releases. The aim of content marketing is to increase the number of visitors going to a company's website, organic search rankings, and brand engagement via social media. Content marketing is a key tool for B2B e-commerce marketers for generating brand awareness, demand generation, sales pipelines, and customer loyalty and retention (Insider Intelligence/eMarketer, 2022l).

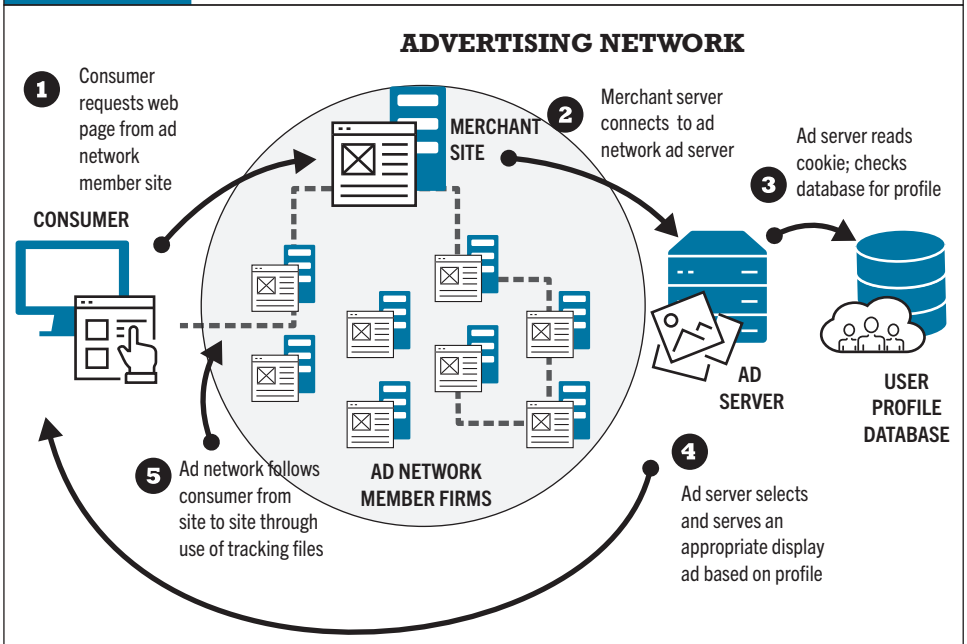
content marketing creates a content campaign for a brand and then attempts to secure placement on a variety of websites

Advertising Networks In the early years of e-commerce, firms placed ads on the few popular websites in existence, but by early 2000, there were hundreds of thousands of sites where ads could be displayed, and it became very inefficient for a single firm to purchase ads on each individual website. Most firms, even very large firms, did not have the capability by themselves of placing banner ads and marketing messages on thousands of websites and monitoring the results. Specialized marketing firms called **advertising networks** appeared to help firms take advantage of the powerful marketing potential of the Internet and to make the entire process of buying and selling online ads more efficient and transparent. These ad networks have proliferated and have greatly increased the scale and liquidity of online marketing.

advertising networks connect online marketers with publishers by displaying ads to consumers based on detailed customer information

Advertising networks represent the most sophisticated application of Internet database capabilities to date and illustrate just how different online marketing is from traditional marketing. Advertising networks sell advertising and marketing opportunities (slots) to companies that wish to buy exposure to an online audience (advertisers). Advertising networks obtain their inventory of ad opportunities from a network of participating sites (referred to as "publishers") that want to display ads on their sites in return for receiving a payment from advertisers every time a visitor clicks on an ad. Marketers buy audiences and publishers sell audiences by attracting an audience and capturing audience information. Ad networks are the intermediaries that make this market work efficiently.

FIGURE 6.6 HOW AN ADVERTISING NETWORK WORKS



Millions of publishers have audiences to sell and pages to fill with ads. Thousands of advertisers are looking for audiences. Ad networks are intermediaries that connect publishers with marketers.

Figure 6.6 illustrates how these systems work. Advertising networks begin with a consumer requesting a page from a member of the advertising network (1). A connection is established with the third-party ad server (2). The ad server identifies the user by reading a tracking file on the user's hard drive and checks its user profile database for the user's profile (3). The ad server selects an appropriate banner ad based on the user's previous purchases, interests, demographics, or other data in the profile (4). Whenever the user later goes online and visits any of the network member sites, the ad server recognizes the user and serves up the same or different ads regardless of the site content. The advertising network follows users from site to site through the use of tracking files (5).

ad exchanges
auction-based digital marketplace where ad networks sell ad space to marketers

programmatic advertising
automated, auction-based method for matching demand and supply for online display ads

real-time bidding (RTB) process
used to match advertiser demand for display ads with publisher supply of web page space

Advertising Exchanges, Programmatic Advertising, Real-Time Bidding Today, most online display advertising is being delivered by ad exchanges that use programmatic advertising and real-time bidding, with programmatic display advertising accounting for more than 90% of all display advertising spending (Insider Intelligence/eMarketer, 2022m). An **ad exchange** is a digital marketplace that uses an automated auction-based method known as **programmatic advertising** to match supply and demand of online display advertising. Programmatic advertising often uses a **real-time bidding (RTB)** process to match advertiser demand for display ads with publisher supply of web page space. Publishers are able to sell their inventory of empty web pages, which is often excess inventory that could not be sold directly. Want to contact males ages 18 to 34 who

are recent visitors to a car site, are unmarried, have a high risk-taking profile, are located in New York or California, live in an urban area, and are employed in the financial service industry? An ad exchange will allow you to bid in real time on this audience against other advertisers and then manage the placement of ads, accounting, and measurement for your firm. Ad exchanges offer tremendous global scale and efficiency. One of the best known is Google's Ad Manager (formerly Google DoubleClick Ad Exchange [AdX]), which includes hundreds of ad networks (the supply side) and provides a digital market for buyers to purchase audiences (the demand side). The case study at the end of the chapter, *Programmatic Advertising: Real-Time Marketing*, provides you with a further look at programmatic advertising, ad exchanges, and real-time bidding.

Display Advertising Issues As with search engine advertising, online display advertising is not without its issues, which include both ad fraud (similar to click fraud) and concerns about viewability (whether display ads are actually being seen).

Ad Fraud. The online advertising industry has become increasingly concerned about the issue of ad fraud. **Ad fraud** involves the practice of falsifying web or mobile traffic in order to charge advertisers for impressions, clicks, or other actions that never actually occurred. Although it is difficult to quantify the amount lost by advertisers because of ad fraud, and although estimates vary widely, a recent study estimated that the amount of digital advertising spending lost to ad fraud worldwide in 2022 would reach $68 billion, with the United States accounting for 35% (about $24 billion) of that amount (Juniper Research, 2022). There are four primary sources of ad fraud. Botnets can be hired by publishers to click on their web pages to create phony traffic. Second, a browser extension can insert ads into a premium publisher's website and then list the ads as available on a programmatic ad exchange. Third, ad targeting firms can create bots that imitate the behavior of real shoppers and then charge advertisers for successfully targeting consumers. Fourth, publishers looking to attract ads to their site can hire people in low-wage countries to click on ads using a proxy server.

ad fraud
falsifying web or mobile traffic in order to charge advertisers for impressions, clicks, or other actions that never actually occurred

Large advertisers have begun to hire online fraud detection firms to determine the extent of fraud in their campaigns. Verizon Wireless, L'Oréal, and Kellogg are among the firms that found millions of dollars of ad fraud in recent campaigns and have demanded advertising networks to either reimburse them or generate real web traffic in the amount of the fraud.

Viewability. A significant percentage of online ad impressions served are not actually viewed or even viewable. There are a number of reasons for this situation. First, there is no mechanism for measuring how many people actually see an online ad that has been served. The same is true of most offline print and TV advertising, although several methods and certifications have been developed over decades to accurately measure audience exposure. There are no such mechanisms for online advertising. Second, a large percentage of ads served appear lower down on the screen, where users are less likely to go, or video ads on auto-play are playing in areas the user cannot see. Advertisers are still charged for ads that are served but not viewed. Unscrupulous publishers can place multiple ads on top of each other and charge multiple times for the same page space. Third, botnets can be programmed to click on ads on fraudulent websites, generating impressions and ad serves even though no one actually sees the ads. The Media Rating Council, an advertising industry group, has a relatively low standard for "viewability": An

ad must be 100% in view for two seconds or more (Knauer, 2022). Unviewed ads are just as profitable as viewed ads for web publishers and advertising agencies. For advertisers, they represent marketing expenditures that are wasted.

Ad Blocking. Over the past several years, the use of ad-blocking software, which can eliminate display ads, pre-roll video ads, retargeted ads, and some types of native ads on desktops and laptops, has been growing. Ad blockers operate in a manner very similar to a firewall, recognizing and eliminating content based on an IP address. Ad blockers have become very easy to install, with programs such as Adblock Plus offered as extensions for Firefox, Chrome, and other web browsers. On average, about 40% of U.S. Internet users employ an ad blocker on either a computer or a mobile device, with younger males the group more likely to use such tools (Insider Intelligence/eMarketer, 2022n).

E-mail Marketing

direct e-mail marketing
e-mail marketing messages sent directly to interested users

When e-mail marketing began, unsolicited e-mail was not common. **Direct e-mail marketing** (e-mail marketing messages sent directly to interested users) was one of the first and most effective forms of online marketing communications. Direct e-mail marketing messages are sent to an opt-in audience of Internet users who, at one time or another, have expressed an interest in receiving messages from the advertiser. By sending e-mail to an opt-in audience, advertisers are targeting interested consumers. By far, in-house e-mail lists are more effective than purchased e-mail lists. Because of the comparatively high response rates and low cost, direct e-mail marketing remains a common form of online marketing communications. Other benefits of e-mail marketing include its mass reach, the ability to track and measure response, the ability to personalize content and tailor offers, the ability to drive traffic to websites for more interaction, the ability to test and optimize content and offers, and the ability to target by region, demographic, time of day, or other criteria. In 2022, U.S. companies are expected to spend about $590 million on e-mail marketing, a relatively small amount when compared to search and display ad marketing (Insider Intelligence/eMarketer, 2022g). But these numbers can be deceiving. E-mail marketing still packs a punch with solid customer response. Click-through rates for legitimate e-mail depend on the promotion (the offer), the product, and the amount of targeting but average around 3%–4%. Despite the deluge of spam mail, e-mail remains a highly cost-effective way of communicating with existing customers and, to a lesser extent, finding new customers. Mobile devices have become the predominant method for accessing e-mail.

E-mail marketing and advertising are inexpensive and somewhat invariant to the number of mails sent. The cost of sending 1,000 e-mails is about the same as the cost of sending 1 million. The primary cost of e-mail marketing is for the purchase of the list of names to which the e-mail will be sent. This generally costs anywhere from 5 to 20 cents a name, depending on how targeted the list is. Sending the e-mail is virtually cost-free. In contrast, the cost to acquire the name, print, and mail a 5-x-7-inch direct mail post card is around 75 to 80 cents a name.

Although e-mail marketing often is sales-oriented, it can also be used as an integral feature of a multi-channel marketing campaign designed to strengthen brand recognition. Relevancy in the form of behavior-based triggers, segmentation, personalization, and targeting remain major themes in e-mail marketing. For instance, Jeep created an

e-mail campaign to a targeted audience who had searched on SUVs and visited Chrysler and Jeep Facebook pages. The e-mail campaign announced a contest based on an online game that involved tracking an arctic beast with a Jeep. Recipients could sign up on Facebook, Twitter, or the Jeep blog.

Although e-mail can still be an effective marketing and advertising tool, it faces three main challenges: spam; software tools used to control spam that eliminate many e-mails from user inboxes; and poorly targeted, purchased e-mail lists. **Spam** is unsolicited commercial e-mail (sometimes referred to as "junk" e-mail), and *spammers* are people who send unsolicited e-mail to a mass audience that has not expressed any interest in the product. Spammers tend to market pornography, fraudulent deals and services, scams, and other products not widely approved in most civilized societies. Legitimate direct opt-in e-mail marketing is not growing as quickly as behaviorally targeted display ads and search engine advertising because of the explosion in spam. Consumer response to even legitimate e-mail campaigns has become more sophisticated. In general, e-mail works well for maintaining customer relationships but works poorly for acquiring new customers.

spam
unsolicited commercial e-mail

Although click fraud may be the Achilles' heel of search engine advertising, spam is the nemesis of effective e-mail marketing and advertising. In 2022, the percentage of all e-mail that is spam is estimated to be around 45% (Statista Research Department, 2022). Most spam originates from bot networks, which consist of thousands of captured PCs that can initiate and relay spam messages (see Chapter 5). Spam is seasonally cyclical and varies monthly because of the impact of new technologies (both supportive and discouraging of spammers), new prosecutions, and seasonal demand for products and services.

Legislative attempts in the United States to control spam have been mostly unsuccessful. The federal CAN-SPAM ("Controlling the Assault of Non-Solicited Pornography and Marketing") Act does not prohibit unsolicited e-mail (spam) but instead requires unsolicited commercial e-mail messages to be labeled (although not by a standard method) and to include opt-out instructions and the sender's physical address. It prohibits the use of deceptive subject lines and false headers in such messages. The FTC is authorized (but not required) to establish a "Do Not E-mail" registry. The act imposes fines of $10 for each unsolicited pornographic e-mail and authorizes state attorneys general to bring lawsuits against spammers. The act obviously makes lawful legitimate bulk mailing of unsolicited e-mail messages (what most people call spam) yet seeks to prohibit certain deceptive practices and to provide a small measure of consumer control by requiring opt-out notices. In this sense, critics point out, CAN-SPAM ironically legalizes spam as long as spammers follow the rules. For this reason, large spammers have been among the bill's biggest supporters, and consumer groups have been the act's most vociferous critics.

Affiliate Marketing

Affiliate marketing is a form of marketing in which a firm pays a commission, typically anywhere between 4% and 20%, when visitors to a different website, blog, or social media page click the firm's link or ad on that website or page and visit the firm's website. Affiliate marketing generally involves pay-for-performance: The affiliate or affiliate network gets paid only if users click on a link or purchase a product. Analysts estimate that companies spent more than $9 billion on affiliate marketing in 2021 (Insider Intelligence/eMarketer, 2022o).

affiliate marketing
commissions paid by advertisers to affiliate websites for referring potential customers to their website

For instance, Amazon has the world's largest affiliate program, called Amazon Associates. Participant sites receive up to 10% commission on sales that their referrals generate. Affiliates attract people to their blogs or websites, where people can click on ads for products at Amazon. Amazon, eBay, and other large e-commerce companies with affiliate programs typically administer such programs themselves. Smaller e-commerce firms who wish to use affiliate marketing often decide to join an affiliate network (sometimes called an affiliate broker), such as CJ Affiliate or Rakuten Linkshare, which acts as an intermediary. Bloggers often sign up for Google's AdSense program to attract advertisers to their sites. They are paid for each click on an ad and sometimes for subsequent purchases made by visitors.

Lead Generation Marketing

lead generation marketing uses multiple e-commerce presences to generate leads for businesses that later can be contacted and converted into customers

Lead generation marketing uses multiple e-commerce presences to generate leads for businesses that later can be contacted and converted into customers through sales calls, e-mail, or other means. In one sense, all online marketing campaigns attempt to develop leads. But lead generation marketing is a specialized subset of the online marketing industry that provides consulting services and software tools to collect and manage leads for firms and to convert these leads to customers. Companies are expected to spend an estimated $3 billion on lead generation marketing in 2022 (Insider Intelligence/eMarketer, 2022g). Sometimes called "inbound marketing," lead generation marketing firms help other firms build websites, launch e-mail campaigns, use social networks and blogs to optimize the generation of leads, and then manage those leads by initiating further contacts, tracking interactions, and interfacing with customer relationship management systems to keep track of customer-firm interactions. One of the foremost lead generation marketing firms is Hubspot, which has developed a software suite for generating and managing leads.

SOCIAL, MOBILE, AND LOCAL MARKETING AND ADVERTISING

In this section we provide a very brief overview of the social, mobile, and local marketing and advertising landscape. Then, in Chapter 7, we provide a much more in-depth examination of social, mobile, and local marketing and advertising tools.

Social marketing/advertising involves the use of online social networks and communities to build brands and drive sales revenues. There are several kinds of social networks, from Facebook, Instagram, TikTok, Twitter, and Pinterest to social apps, social games, blogs, and forums (websites that attract people who share a community of interests or skills). In 2022, companies are expected to spend about $75 billion on social network marketing and advertising. Even so, that represents only about 30% of the amount spent on all online marketing (Insider Intelligence/eMarketer, 2022p).

Social networks offer advertisers all the main advertising formats, including banner ads, native advertising, video ads, and sponsorship of content. Having a corporate Facebook page is in itself a marketing tool for brands, just like a web page is. Many firms, such as Coca-Cola, have shut down product-specific web pages and instead use Facebook pages.

Blogs can also be used for social marketing. Blogs have been around for decades and are a part of the mainstream online culture (see Chapter 3 for a description of blogs). Blogs play a vital role in online marketing. Social networks have not replaced blogs and, in fact, often point to blogs for long-form content. Because blog readers and creators

tend to be more educated, have higher incomes, and be opinion leaders, blogs are ideal platforms for ads for many products and services that cater to this kind of audience. Because blogs are based on the personal opinions of the writers, they are also an ideal platform to start a viral marketing campaign. Advertising networks that specialize in blogs provide some efficiency in placing ads, as do blog networks, which are collections of a small number of popular blogs that are coordinated by a central management team and that can deliver a larger audience to advertisers.

Influencer marketing is another form of social media marketing that began initially with bloggers and has since expanded to a wide variety of social networks. Influencer marketing uses endorsements and product mentions from people who have dedicated followers on social media and who are viewed by those followers as trusted experts or celebrities. Brands seek to leverage the trust that influencers have built up with their following and translate recommendations from influencers into sales.

Marketing on the mobile platform has exploded and now constitutes more than two-thirds of the overall $250 billion expected to be spent on online marketing in 2022. In 2022, spending on all forms of mobile marketing is estimated to be about $170 billion, and it is expected to increase to almost $250 billion by 2026 (Insider Intelligence/eMarketer, 2022q). A number of factors are driving advertisers to the mobile platform, including much more powerful devices, faster cellular networks, wireless local networks, rich media and video ads, and growing demand for local advertising by small businesses and consumers. Most importantly, mobile is where the eyeballs are now and increasingly will be in the future: About 280 million people access the Internet at least some of the time from mobile devices.

Mobile marketing includes the use of banner ads, rich media, video, native advertising, games, e-mail, text messaging, in-store messaging, Quick Response (QR) codes, and couponing. Mobile is now a required part of the standard marketing budget. Apps on mobile devices constitute a marketing platform that did not exist 15 years ago. Apps are a nonbrowser pathway for users to experience the Web and perform a number of tasks, from reading the newspaper to shopping, searching, and buying. Apps provide users much faster access to content than do multi-purpose browsers. Apps have begun to influence the design and function of traditional websites as consumers are attracted to the look and feel of apps and their speed of operation.

Along with social marketing and mobile marketing, local marketing is another important part of today's online marketing universe. The growth of mobile devices has accelerated the growth of local search and purchasing. Marketing tools like local advertisements on social networks and daily deal sites are also contributing to local marketing growth. In 2022, companies are expected to spend about $79 billion on local online marketing, with about 41% of that amount (about $32 billion) on the mobile platform (BIA Advisory Services, 2022).

We examine social, mobile, and local marketing in much greater depth in Chapter 7.

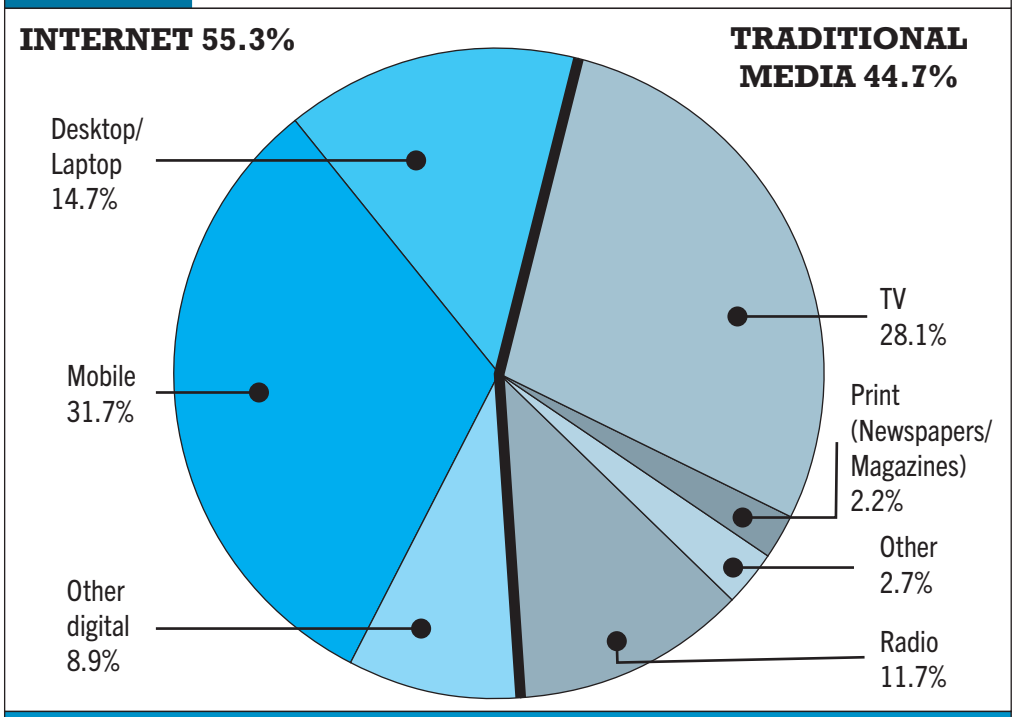
MULTI-CHANNEL MARKETING: INTEGRATING ONLINE AND OFFLINE MARKETING

Without an audience, marketing is not possible. With the rapid growth of the Internet, media consumption patterns have changed greatly as consumers are more and more likely to engage with online media, from videos and news sites to blogs, Twitter feeds,

Facebook friends, and Pinterest posts. Increasingly, marketers are using multiple online channels to "touch" customers, from e-mail to Facebook, search ads, display ads on mobile devices, and affiliate programs. Forrester Research reports, for instance, that nearly two-thirds (62%) of all U.S. retail sales are now digitally influenced, with most online purchases following multiple exposures to online marketing efforts (Vail, 2021).

In 2013, for the first time ever, the average U.S. adult spent more time with digital media per day than the amount of time spent viewing TV. In 2022, the average adult will spend about eight and a quarter hours a day online and using a mobile device for something other than telephone calls, compared to about three hours watching television (Intelligence Insider/eMarketer, 2022c). An increasing percentage of U.S. media consumers multitask by using several media at once, which increases the total media exposure. In this environment, marketers increasingly are developing multi-channel marketing programs that can take advantage of the strengths of various media and reinforce branding messages across media. Online marketing is not the only way, or by itself the best way, to engage consumers. Internet campaigns can be significantly strengthened by also using e-mail, TV, print, and radio. The marketing communication campaigns most successful at driving traffic to a website have incorporated both online and offline tactics rather than relying solely on one or the other. Several research studies have shown that the most effective online advertisements are those that use consistent imagery with campaigns running in other media at the same time. **Figure 6.7** illustrates the amount of

FIGURE 6.7 AVERAGE TIME SPENT PER DAY WITH MAJOR MEDIA



Online marketing should be coupled with offline marketing to achieve optimal effectiveness.
SOURCE: Based on data from Insider Intelligence/eMarketer, 2022r.

time U.S. adults spend with different types of media on an average day. *Insight on Business: Are the Very Rich Different from You and Me?* examines how luxury goods providers use online marketing in conjunction with their offline marketing efforts.

OTHER ONLINE MARKETING STRATEGIES

In addition to the "traditional" online marketing and advertising tools we have previously discussed, such as search engine, display, and e-mail marketing and the newer social, mobile, and local marketing and advertising tools, there are also a number of other, more focused online marketing strategies. Here we examine tools aimed at customer retention, pricing, and a strategy known as the "long tail."

Customer Retention Strategies

The Internet offers several extraordinary marketing techniques for building a strong relationship with customers and for differentiating products and services.

Personalization, One-to-One Marketing, Behavioral Targeting No Internet-based marketing technique has generated more comment and controversy than "one-to-one" or "personalized marketing." **One-to-one marketing (personalization)** segments the market on the basis of individuals (not groups), based on a precise and timely understanding of their needs, targeting specific marketing messages to these individuals and then positioning the product vis-à-vis competitors to be truly unique. One-to-one marketing is the ultimate form of market segmentation, targeting, and positioning—in which the segments are individuals.

one-to-one marketing (personalization) segmenting the market based on a precise and timely understanding of individuals' needs, targeting specific marketing messages to these individuals, and then positioning the product vis-à-vis competitors to be truly unique

The movement toward market segmentation has been ongoing since the development of systematic market research and mass media in the 1930s. However, e-commerce and the Internet are different in that they enable personalized one-to-one marketing to occur on a mass scale.

The Amazon website is a good example of personalization at work. The site greets registered users by name (based on cookie files), recommends purchases based on user preferences (stored in a user profile in their database) as well as on what other consumers purchased, and expedites checkout procedures based on prior purchases.

Behavioral targeting (also known as **interest-based advertising**) involves using the online and offline behavior of consumers to adjust the advertising messages delivered to them online, often in real time (milliseconds from the consumer's first URL entry). The intent is to increase the efficiency of marketing and advertising and to increase the revenue streams of firms who are in a position to behaviorally target visitors.

behavioral targeting (interest-based advertising) involves using online and offline behavior of consumers to adjust the advertising messages delivered to them online

One of the original promises of the Web has been that it can deliver a marketing message tailored to each consumer based on this data and then measure the results in terms of click-throughs and purchases. If you are visiting a jewelry site, you would be shown jewelry ads. If you entered a search query like "diamonds," you would be shown text ads for diamonds and other jewelry. This was taken one step further by advertising networks, which could follow you across thousands of websites, come up with an idea of what you are interested in as you browse, and then display ads related to those interests. For instance, if you visit several men's clothing sites within the course of a few hours, you will be shown ads for men's clothing on most other sites you visit subsequently, regardless of the sites' subject content. If you search for a certain pair of shoes at Zappos, you

INSIGHT ON BUSINESS

ARE THE VERY RICH DIFFERENT FROM YOU AND ME?

"Let me tell you about the very rich. They are different from you and me." So observed F. Scott Fitzgerald in the short story "The Rich Boy." Palm Beach has its Worth Avenue, New York has its Fifth Avenue, Los Angeles has its Rodeo Drive, and Chicago has the Magnificent Mile. So where do the rich go to get that $5,000 cocktail dress or that $3,000 Italian suit online? It turns out they may not be so different from the rest of us: They also look for online deals and situations where quality can be had at a bargain.

Even experts find it hard to define what it means to be affluent. About 33% of all U.S. households (about 43 million) have annual household incomes of $100,000 or more. These are often referred to as HENRYs (High Earners, Not Rich Yet). But the really affluent (sometimes called the hyperaffluent) are those 1.3 million (the top 1% of U.S. households) that earn more than $500,000 a year.

Retail consumption in general is highly skewed: The wealthiest top 20% of households account for about 40% of all retail spending. Although luxury shopping is typically still very much an in-person activity, wealthy Americans are increasingly purchasing luxury products online. Online sales of personal luxury goods are expected to account for almost 25% of sales of such goods in 2022.

The Yoox Net-a-Porter Group (YNAP) is one of the world's leading online luxury fashion retailers, reaching more than 180 countries. YNAP operates four primary multi-brand online stores: Net-a-Porter (for women), Mr Porter (for men), Yoox (offering a wide selection of well-made yet accessible pieces for both men and women), and the Outnet (discount luxury shopping). Luxury goods designers would not even consider selling to Net-a-Porter when it initially launched in 2000. Affluent women in that period only bought clothes they had seen, touched, and tried on. That all has changed in the last decade. For instance, Net-a-Porter currently sells more than 800 of the world's most fashionable high-end brands, from Gucci to Tory Burch to Alexander McQueen. YNAP also operates e-commerce sites for more than 30 luxury brands, including Armani, Chloe, Missoni, and Valentino, among others. YNAP is owned by Compagnie Financiere Richemont SA, which also owns luxury brands Cartier, Piaget, Baume & Mercier, Montblanc, and Van Cleef & Arpels.

YNAP also has a number of competitors, most notably Farfetch, a UK-based online marketplace similar to eBay but that specifically caters to the luxury goods industries. Farfetch offers goods from a variety of major luxury retailers, such as Burberry, Stella McCartney, Jil Sanders, and Harvey Nichols as well as more than 1,400 brands, boutiques, and department stores in more than 50 countries around the world. In late 2021, Farfetch and YNAP entered into talks about a potential merger agreement, and in August 2022, Farfetch agreed to acquire 47.5% of YNAP from Richemont, with Richemont acquiring 10% of Farfetch.

Even the rich are not immune to the lure of a good deal. The problem is that luxury retailers are typically loathe to offer sales because they believe sales detract from their reputations. To get around this problem, luxury retailers often offer "secret" discounts via flash e-mail campaigns and private online sales for which selected online customers are e-mailed alerts. Neiman Marcus calls them Midday Dash sales: two-hour online-only sales with up to 50% off

on luxury goods that can be purchased only by clicking a link in the e-mail.

Luxury retailers have another dilemma: They need to attract not just the ultra-affluent but also the aspirational HENRYs, who are far more numerous and anxious to display their wealth. Luxury retailers need to be both exclusive and accessible. One solution is the so-called Mercedes Benz strategy: Build luxurious but affordable cars for the HENRYs while maintaining a focus on high-end, truly luxury models for the ultra-affluent. Mercedes Benz combines a dual-level product strategy with effective use of social and mobile media. The explosion of social media and the increasing investments in the online channel by luxury companies have reinforced and enlarged the community of those who explore, comment upon, and eventually purchase luxury goods. Mercedes' Facebook page is a main hub of interaction between the brand and its customers, with 22 million followers, who are entertained with sweepstakes, videos, images, news, and links to its blog for additional insight into why Mercedes is unique and worth all that money. Mercedes also uses YouTube, Instagram, TikTok, Twitter, and Pinterest to engage a broad range of customers by providing personalized video tours of its cars.

Tiffany & Co. has also faced the challenge of developing an online marketing approach that increases a company's access to consumers while retaining an image of exclusivity. The company is in the enviable position of being perhaps the most famous jewelry company in the United States. Tiffany's offline marketing communications seek to engender feelings of beauty, quality, and timeless style—all hallmarks of the Tiffany brand. How does Tiffany maintain its approach on the Web, a medium that often emphasizes speed and flashy graphics over grace and elegance, and low-cost bargains over high-priced, exclusive fashion? The Web, for the most part, is all about low prices and great deals—concepts that are anathema to high-fashion merchants like Tiffany. The answer is apparent in a visit to the Tiffany website. The site features limited inventory, with a focus on high-resolution images of its exclusive and original designs in jewelry and apparel. There are no sales, coupons, discounts, or other offers, although visitors can choose jewelry in lower price ranges (less than $250, for instance). The website and Facebook brand page reflect custom service and design, tranquility, and simplicity. The prices are equally exclusive: an exquisite Atlas Hinged Bangle in 18k rose gold with round, brilliant diamonds for $14,000 and sunglasses for $500.

Today, Tiffany has shifted more of its direct marketing effort from the offline catalog to the online catalog and an increasing social media presence, including on Facebook (more than 10 million followers), Instagram, Pinterest, Twitter, Tumblr, and YouTube. Tiffany is now recognized as one of the leaders in digital competence among luxury jewelry brands. For instance, research firm Gartner named Tiffany as one of just three brands that received the highest rating (Genius) in its 2021–2022 Digital IQ Index, based on its robust approach to content marketing, agility through scale, and embrace of customer centricity. In 2022, Tiffany even dove into the world of NFTs, announcing a limited issue of NFTs (NFTiffs) that can be redeemed for custom jewelry.

SOURCES: "Richemont and Farfetch: Breaking Down the YNAP Deal," by Julie Zerbo, Thefashionlaw.com, August 26, 2022; Yoox Net-a-Porter Group, "Who We Are," Ynap.com, accessed August 4, 2022; "Tiffany Is Selling Custom CryptoPunk Pendants for $50,000, " by Emma Roth, Theverge.com, August 1, 2022: "Household Income Distribution in the United States in 2020," by Statista Research Department, July 27, 2022; "US Personal Luxury Retail Ecommerce Sales," Insider Intelligence/eMarketer, June 2022; "Gartner Announces the 2021–2022 Brands in the Garnter Digital IQ Index," Gartner.com, May 25, 2022; "Which Luxury Products Do US Shoppers Buy In-Store?" by Sara Lebow, Insider Intelligence/eMarketer, February 15, 2022; "Richemont, Farfetch in 'Advanced' Discussions to Merge Platforms," by Samantha Conti, Wwd.com, November 12, 2021; "The Post-Covid Luxury Spending Boom Has Begun. It's Already Reshaping the Economy," by Andrew Van Dam and Heather Long, *Washington Post*, June 18, 2021; "With Online Luxury in Vogue, Richemont Snaps up Yoox Net-a-Porter," by Matthew Dalton, *Wall Street Journal*, January 22, 2018.

will be shown ads for the exact same shoes at other sites, such as Facebook. Behavioral targeting combines nearly all of your online behavioral data into a collection of interest areas and then shows you ads based on those interests as well as the interests of your friends. What's different about behavioral targeting is the breadth of data collected: your e-mail content, social network page content, friends, purchases online, books read or purchased, newspaper sites visited, and many other behaviors.

And finally, ad exchanges take the marketing of all this information one step further. Most popular websites have tracking programs on their home pages that are owned by third-party data collector firms, who then sell this information in real time to the highest-bidding advertiser in real-time online auctions. Ad exchanges make it possible for advertisers to retarget ads at individuals as they roam across the Internet. **Retargeting** (sometimes also referred to as **remarketing**) involves showing the same or similar ads to individuals across multiple websites or apps. Retargeting has become a popular tactic, in large part because of its perceived effectiveness. However, the use of behavioral targeting in online advertising, particularly behavioral targeting based on third-party tracking tools, has met with increasing public and political resistance, and within the last few years, Big Tech firms such as Apple and Google have begun to implement policies that prevent certain types of tracking. At the same time, although most consumers are very concerned about data privacy and protecting their information, more than 50% expect a personalized experience every time they interact with a brand. This presents significant challenges for online marketers (Schultz, 2022). We further examine the technologies involved in behavioral targeting in Section 6.3 and privacy concerns in Chapter 8.

retargeting (remarketing)
showing the same or similar ads to individuals across multiple websites or apps

As behavioral targeting becomes more difficult, companies are turning to a different method, known as contextual advertising, to serve somewhat personalized ads. **Contextual advertising** attempts to deliver relevant ads by matching characteristics of the ad (such as the product, message, and brand positioning) with characteristics of the content adjacent to the ad placement (such as topic, keyword, genre, and tone). More than 40% of U.S. marketing executives recently surveyed said they were increasing their emphasis on contextual advertising in 2022 (IAB/Ipsos, 2022).

contextual advertising
attempts to deliver relevant ads by matching characteristics of the ad with characteristics of the content adjacent to the ad placement

Customization and Customer Co-Production Customization is an extension of personalization. **Customization** means changing the product—not just the marketing message—according to user preferences. **Customer co-production** means the users participate in the creation of the new product.

customization
changing the product, not just the marketing message, according to user preferences

customer co-production
takes customization one step further by allowing the customer to interactively create the product

Many leading companies now offer "build-to-order," customized products on a large scale, creating product differentiation and, hopefully, customer loyalty. Customers appear to be willing to pay a little more for a unique product. The key to making the process affordable is to build a standardized architecture that lets consumers combine a variety of options. For example, Nike offers customized sneakers through its NIKEiD program on its website. Consumers can choose the type of shoe, colors, material, and even a logo of up to eight characters. Nike transmits the orders via computers to specially equipped plants in China and Korea. At the My M&M's website, customers can get their own message printed on custom-made M&Ms.

Information goods—goods whose value is based on information content—are also ideal for this level of differentiation. For instance, the *New York Times*—and many other

content distributors—allows customers to select the news they want to see on a daily basis. Many websites, particularly portals such as Yahoo, MSN, and AOL, allow customers to create their own customized version of the website. Such pages frequently require security measures such as usernames and passwords to ensure privacy and confidentiality.

Customer Service A company's approach to customer service can significantly help or hurt its marketing efforts. Online customer service is more than simply following through on order fulfillment; it involves users' ability to communicate with a company and obtain desired information in a timely manner. Customer service can help reduce consumer frustration, cut the number of abandoned shopping carts, and increase sales.

Most consumers want to, and will, serve themselves as long as the information they need to do so is relatively easy to find. Online buyers typically do not expect or desire "high-touch" service unless they have questions or problems, in which case they want relatively speedy answers that are responsive to their individual issue. Researchers have found that customer loyalty increases substantially when online buyers learn that customer service representatives are available online or at an 800-number and are willing and able to resolve the situation quickly. Conversely, online buyers who do not receive satisfaction at these critical moments often terminate their relationship with the business and switch to merchants that may charge more but that deliver superior customer service.

There are a number of tools that companies can use to encourage interaction with prospects and customers and provide customer service—FAQs, customer service chat systems, intelligent agents, and automated response systems—in addition to the customer relationship management systems described more fully later in the chapter.

Frequently asked questions (FAQs), a text-based listing of common questions and answers, provide an inexpensive way to anticipate and address customer concerns. Adding a FAQ page helps users track down needed information more quickly, enabling them to help themselves resolve questions and concerns. By directing customers to the FAQs page first, websites can give customers answers to common questions. If a question and answer do not appear, it is important for sites to make contacting a live person simple and easy. Offering an e-mail link to customer service or a real-time customer chat system option to the FAQs page is one solution.

frequently asked questions (FAQs) a text-based listing of common questions and answers

Real-time customer service chat systems (in which a company's customer service representatives, or increasingly an artificial intelligence-powered chat bot, interactively exchange text-based messages with customers on a real-time basis) are an increasingly popular way for companies to assist online shoppers during a purchase. "Click to call" or "live call" is another version of a real-time online customer service system, in which the customer clicks a link or accepts an invitation to have a customer service representative call them on the telephone. Leading vendors of customer service chat systems include LivePerson and ClickDesk.

real-time customer service chat systems a company's customer service representatives interactively exchange text-based messages with one or more customers on a real-time basis

Intelligent agent technology is another way to provide assistance to online shoppers. Intelligent agents are part of an effort to reduce costly contact with customer service representatives. **Automated response systems** send e-mail order confirmations and acknowledgments of e-mailed inquiries, in some cases letting the customer know

automated response system sends e-mail order confirmations and acknowledgments of e-mailed inquiries

that it may take a day or two to actually locate an answer to their question. Automated shipping confirmations and order status reports are also common.

Pricing Strategies

As we noted in Chapter 1, during the early years of e-commerce, many academics and business consultants predicted that the Web would lead to a new world of information symmetry and "frictionless" commerce. In this world, newly empowered customers, using intelligent shopping agents and the nearly infinite amount of product and price information available on the Internet, would shop around the world (and around the clock) with minimal effort, driving prices down to their marginal cost and driving intermediaries out of the market as customers began to deal directly with producers (Wigand and Benjamin, 1995; Rayport and Sviokla, 1995; Evans and Wurster, 1999; Sinha, 2000). The result was supposed to be an instance of the **Law of One Price**: With complete price transparency in a perfect information marketplace, one world price for every product would emerge. Frictionless commerce would, of course, mean the end of marketing based on brands.

Law of One Price
with complete price transparency in a perfect information marketplace, there would be one world price for every product

But it didn't work out this way. Firms still compete for customers based on price as well as product features, scope of operations, and focus. **Pricing** (putting a value on goods and services) is an integral part of marketing strategy. Together, price and quality determine customer value. Pricing of e-commerce goods has proved very difficult for both entrepreneurs and investors to understand.

pricing
putting a value on goods and services

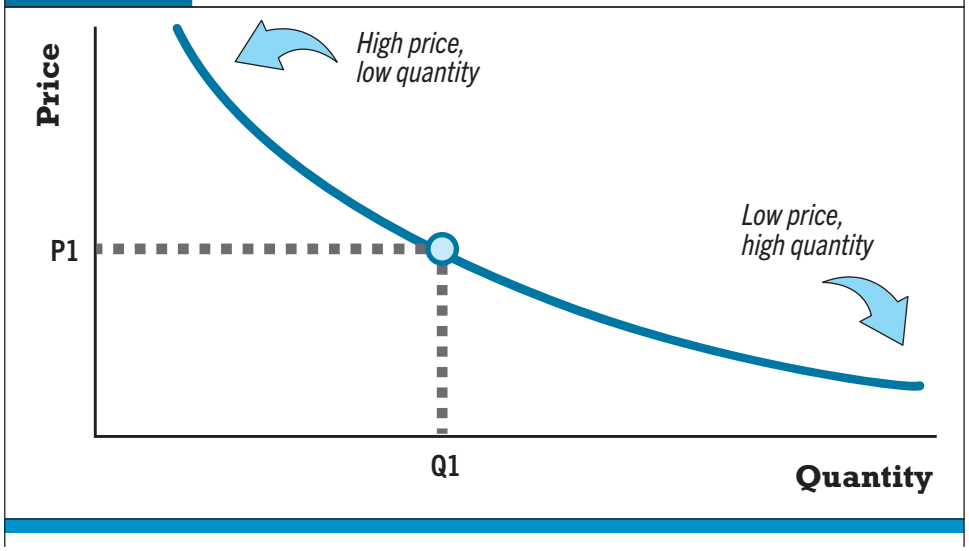
In traditional firms, the prices of traditional goods—such as books, drugs, and automobiles—are usually based on their fixed and variable costs as well as on the market's **demand curve** (the quantity of goods that can be sold at various prices). *Fixed costs* are the costs of building the production facility. *Variable costs* are costs involved in running the production facility—mostly labor. In a competitive market, with undifferentiated goods, prices tend toward their *marginal costs* (the incremental cost of producing the next unit) after manufacturers have paid the fixed costs to enter the business.

demand curve
the quantity of goods that can be sold at various prices

Firms usually "discover" their demand curves by testing various price and volume bundles while closely watching their cost structure. Normally, prices are set to maximize profits. A profit-maximizing company sets its prices so that the *marginal revenue* (the revenue a company receives from the next unit sold) from a product just equals its marginal costs. If a firm's marginal revenue is higher than its marginal costs, it would want to lower prices a bit and sell more product (why leave money on the table when you can sell a few more units?). If its marginal revenue for selling a product is lower than its marginal costs, then the company would want to reduce volume a bit and charge a higher price (why lose money on each additional sale?).

In the early years of e-commerce, something unusual happened. Sellers were pricing their products far below their marginal costs. Some sites were losing money on every sale. How could this be? The answer: Online merchants could sell below their marginal costs (even giving away products for free) simply because a large number of entrepreneurs and their venture capitalist backers thought this was a worthwhile activity, at least in the short term. The idea was to attract users with free goods and services, and then later, once the consumer was part of a large, committed audience, to charge advertisers

FIGURE 6.8 A DEMAND CURVE



A demand curve shows the quantity of product (Q) that could be sold at various prices (P).

enough money to make a profit and (maybe) to charge customers subscription fees for value-added services. To understand the behavior of entrepreneurial firms, it is helpful to examine a traditional demand curve (see **Figure 6.8**).

A small number of customers are willing to pay a great deal for the product—far above P1. A larger number of customers would happily pay P1, and an even larger number of customers would pay less than P1. If the price were zero, the demand might approach infinity! Ideally, to maximize sales and profits, a firm would like to pick up all the money in the market by selling the product at the price each customer is willing to pay. This is called **price discrimination**—selling products to different people and groups based on their willingness to pay. If some people really want the product, sell it to them at a high price. But sell it to indifferent people at a much lower price; otherwise, they will not buy. This works only if the firm can (1) identify the price each individual would be willing to pay and (2) segregate the customers from one another so that they cannot find out what the others are paying. Therefore, most firms adopt a fixed price for their goods (P1) or a small number of prices for different versions of their products.

price discrimination selling products to different people and groups based on their willingness to pay

What if the marginal cost of producing a good is zero? What should the price be for these goods? It would be impossible in this case to set prices based on equalizing marginal revenue and marginal cost—because marginal cost is zero. The Internet is primarily filled with information goods—from music to research reports, to stock quotes, stories, weather reports, articles, pictures, and opinions—whose marginal cost of production is zero when distributed via the Internet. Thus, another reason certain goods, such as some information goods, may be free on the Internet is that they are "selling" for what it costs to produce them—next to nothing. Content that is stolen has zero production costs. Content that is contributed by users also has zero production costs for the websites themselves.

Free and Freemium Everyone likes a bargain, and the best bargain is something for free. Free is not new: Banks used to give away "free" toasters to depositors in the 1950s. There can be a sensible economic logic to giving things away. Free content can help build market awareness and can lead to sales of other follow-on products. Finally, free products and services knock out potential and actual competitors. "Freemium" is another pricing strategy. The freemium pricing model is a cross-subsidy online marketing strategy in which users are offered a basic service for free but must pay for premium or add-on services. The people who pay for the premium services hopefully will pay for all the free riders on the service. Dropbox, Spotify, and a host of others offer premium services at a price in order to support free services.

"Free" and "freemium" as pricing strategies do have limits. Many e-commerce businesses have found it difficult to convert the users into paying customers. Free sites attract hundreds of millions of price-sensitive "freeloaders" who have no intention of ever paying for anything and who switch from one free service to another at the very mention of charges. "Free" eliminates a rich price discrimination strategy. Clearly some of the freeloaders would indeed pay a small amount each month, and this revenue is lost to the firms who offer significant services for free. Some argue that everything digital will one day be free in part because Internet users expect it to be so. But the history of "free" includes broadcast television, which used to be "free" (it was advertising-supported). However, the public eventually had no problem moving to cable television and DVDs as paid services. The exceptions to "free" are the truly valuable streams of information that are exclusive, expensive to produce, not widely distributed, and unique and that have immediate consumption or investment value.

versioning
creating multiple versions of information goods and selling essentially the same product to different market segments at different prices

Versioning One solution to the problem of free information goods is **versioning**—creating multiple versions of the goods and selling essentially the same product to different market segments at different prices. In this situation, the price depends on the product's value to the consumer. Consumers will segment themselves into groups that are willing to pay different amounts for various versions. Versioning fits well with a modified "free" strategy. A reduced-value version can be offered for free, while premium versions can be offered at higher prices. What are characteristics of a "reduced-value version"? Low-priced—or in the case of information goods, even "free"—versions might be less convenient to use, less comprehensive, slower, and less powerful and offer less support than the high-priced versions. The *New York Times*, and many other online newspapers and magazines, for instance, allow you to read a certain number of articles a month online for free, but if you want to read more articles, you must have a digital subscription. Some websites offer "free services" with advertising but turn off the ads for a monthly fee.

Bundling "Ziggy" Ziegfeld, a vaudeville entrepreneur at the turn of the twentieth century in New York, noticed that nearly one-third of his theater seats were empty on some Friday nights, and during the week, matinee shows were often half empty. He came up with an idea for bundling tickets into "twofers": Pay for one full-price ticket and get the next ticket free. Twofers are still a Broadway theater tradition in New York. They are based on the idea that (1) the marginal cost of seating another patron is zero and (2) a great many people who would not otherwise buy a single ticket would buy a "bundle" of tickets for the same or even a slightly higher price.

Bundling extends the concept of a twofer. **Bundling** offers consumers two or more goods for a price that is less than the goods would cost when purchased individually. The key idea behind the concept of bundling is that although consumers typically have very diverse ideas about the value of a single product, they tend to agree much more on the value of a bundle of products offered at a fixed price. In fact, the per-product price people are willing to pay for the bundle is often higher than when the products are sold separately. Bundling reduces the variance (dispersion) in market demand for goods.

bundling
offers consumers two or more goods for a reduced price

Dynamic Pricing and Flash Marketing The pricing strategies we have discussed so far are all fixed-price strategies. Versions and bundles are sold for fixed prices based on the firm's best effort at maximizing its profits. But what if there is product still left on the shelf along with the knowledge that someone, somewhere, would be willing to pay something for it? It might be better to obtain at least some revenue from the product, rather than let it sit on the shelf or even perish. Imagine also that there are some people in every market who would pay a hefty premium for a product if they could have it right away. In other situations, such as for an antique, the value of the product has to be discovered in the marketplace (usually because there is a belief that the marketplace would value the product at a much higher price than its owner paid as a cost). In other cases, the value of a good is equal to what the market is willing to pay (and has nothing to do with its cost). Or let's say you want to encourage frequent visits to your site and offer some really great bargains for a few minutes each day or for the whole day with a set time limit. Here is where dynamic pricing mechanisms come to the fore and where the strengths of the Internet can be seen. With **dynamic pricing**, the price of the product varies, depending on the demand characteristics of the customer and the supply situation of the seller.

dynamic pricing
the price of the product varies, depending on the demand characteristics of the customer and the supply situation of the seller

There are a number of different kinds of dynamic pricing mechanisms. For instance, *auctions* have been used for centuries to establish the instant market price for goods. Auctions are flexible and efficient market mechanisms for pricing unique or unusual goods as well as commonplace goods such as computers, cameras, and other types of electronic devices. We discuss auctions in more depth in Chapter 11.

Yield management is quite different from auctions. In auctions, thousands of consumers establish a price by bidding against one another. In *yield management*, managers set prices in different markets, appealing to different segments, in order to sell excess capacity. Airlines exemplify yield management techniques. Every few minutes during the day, they adjust prices of empty airline seats to ensure that at least some of the 50,000 empty airline seats are sold at some reasonable price—even below marginal cost of production. Amazon and other large online retailers frequently use yield management techniques that involve changing prices hourly to stimulate demand and maximize revenues. Amazon can also track shopping behavior of individuals seeking a specific product. As the consumer searches for the best price, Amazon can observe the offering prices on other websites and then adjust its prices dynamically so that when the user visits Amazon again, a lower price will be displayed than the prices at all other sites visited.

Yield management works under a limited set of conditions. Generally, the product is perishable (an empty airline seat perishes when the plane takes off without a full load); there are seasonal variations in demand; market segments are clearly defined; markets are competitive; and market conditions change rapidly. In general, only very large firms with extensive monitoring and database systems in place have been able to afford yield management techniques.

Surge pricing is a kind of dynamic pricing used by companies such as Uber. Uber uses a dynamic pricing algorithm to optimize its revenue or, as the company claims, to balance supply and demand. Critics claim that the practice amounts to price gouging, which during an emergency is illegal in some states.

Flash marketing is a third dynamic pricing technique. Flash marketing has proved extraordinarily effective for travel services, luxury clothing goods, and other goods. Using e-mail or dedicated website features to notify loyal customers (repeat purchasers), merchants offer goods and services for a limited time (usually hours) at very low prices. Critics point out that flash marketing can take advantage of compulsive shoppers and lead to overshopping for unneeded goods.

Long Tail Marketing

Consumers distribute themselves in many markets according to a power curve in which 80% of the demand is for the hit products and demand for nonhits quickly recedes to a small number of units sold. In a traditional market, niche products are so obscure that no one ever hears about them. One impact of the Internet and e-commerce on sales of obscure products with little demand is that obscure products become more visible to consumers via search engines, recommendation engines, and social networks. Hence, online retailers can earn substantial revenue selling products for which demand and price are low. In fact, with near-zero inventory costs and a good search engine, the sales of obscure products can become a much larger percentage of total revenue. Amazon, for instance, has millions of e-book titles for sale at $2.99 or less, many written by obscure authors. Because of its search and recommendation engines, Amazon is able to generate profits from the sale of this large number of obscure titles. This is called the **long tail effect**. See *Insight on Technology: The Long Tail: Big Hits and Big Misses.*

long tail effect
a colloquial name given to various statistical distributions characterized by a small number of events of high amplitude and a very large number of events with low amplitude

6.3 ONLINE MARKETING TECHNOLOGIES

Online marketing has many similarities to and differences from ordinary marketing. The objective of online marketing—as in all marketing—is to build customer relationships so that the firm can achieve above-average returns (both by offering superior products or services and by communicating the product's features to the consumer). But online marketing is also very different from ordinary marketing because the nature of the medium and its capabilities are so different from anything that has come before. To understand just how different online marketing can be and in what ways, you first need to become familiar with some basic online marketing technologies.

THE REVOLUTION IN ONLINE MARKETING TECHNOLOGIES

In Chapter 1, we listed eight unique features of e-commerce technology. **Table 6.5** describes how marketing has changed as a result of these new technical capabilities.

On balance, the Internet has had four very powerful impacts on marketing. First, the Internet, as a communications medium, has broadened the scope of marketing communications—in the sense of the number of people who can be easily reached as well as the locations where they can be reached, from desktops to smartphones

INSIGHT ON TECHNOLOGY

THE LONG TAIL: BIG HITS AND BIG MISSES

Coined by *Wired Magazine* writer Chris Anderson, the Long Tail describes statistical distributions characterized by a small group of events of high amplitude and a large group of events with low amplitude. The concept is straightforward. Think Hollywood movies: There are a few big hits and also thousands of films that no one ever hears about. It's the legion of misses that make up the Long Tail. Anderson believed that the Web would change the rules: No matter how much content you put online, someone, somewhere will show up to buy it, thanks to online search, social networks, and recommendation engines.

On the Internet, where search costs are tiny and where companies aren't forced to maintain a physical store, online retailers like Amazon and Alibaba offer millions of products for sale, compared to what typical bricks-and-mortar retailers can offer. Wherever you look on the Web, you can find items that only a few people are interested in buying. But with more than 4.5 billion people online, even a one-in-a-million product could find 4,500 buyers.

One problem with the Long Tail is that people sometimes have difficulty finding niche products because these products are—by definition—largely unknown. Well-designed recommender systems can combat this issue by guiding consumers to obscure results that may better answer a search query than the more popular selections. Netflix and Amazon have spent millions on improving their recommender systems, and Pandora's recommender system focuses on generating quality music without regard to popularity.

Search engine optimization is another area in which marketers are trying to unlock the power of the Long Tail. Long Tail keywords are phrases that a small but significant number of people might use to find products. For instance, instead of investing in keywords such as "shoes" or "men's shoes," which are dominated by bigger retailers, marketers focused on the Long Tail might choose a keyword like "purple all-weather running shoes," for which their firm is much likelier to outrank its competition. Because Long Tail searches are, by definition, more specific, marketers can achieve conversion rates more than twice as high as more popular keywords and searches if they are able to match the right products with these types of searches. Long Tail searches comprise as much as 70% of all search queries according to Hitwise, and around 15% of daily Google searches are search queries that have never been used before. Google has added features that improve these types of searches, including a feature called broad match, which allows a keyword to trigger an advertisement even when the search phrase is misspelled or worded confusingly. With the advent of voice-activated speakers and other devices, more consumers are using natural language searches (searches that are phrased in the way we would speak naturally, like "Where is the nearest pizza place?") to find products and services. Because voice search is relatively new compared to traditional text-based search, these searches are likelier to belong to the Long Tail.

Anderson believed that the Internet would revolutionize digital content by making even niche products highly profitable and that the revenues produced by small niche products would ultimately outweigh the revenues of hit movies, songs, and books. But newer research is mixed on the revenue potential in the Long Tail. Solid best sellers have expanded and produce the overwhelming majority of online media revenues. Several papers that have looked at consumer

(continued)

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habits on different platforms, including Netflix and music-streaming service Rhapsody, concluded that as the number of choices facing a consumer continues to grow, the likelier customers are to stick with the safer options that they already know. Netflix credits its growth in revenue and subscribers to its list of original series and blockbuster hits, not to the thousands of titles in its Long Tail. In fact, its DVD business, where most of its Long Tail titles are available, has a little less than 2 million U.S. subscribers, compared to more than 220 million worldwide subscribers of its streaming service, which consists primarily of new, original series and more popular movies and TV shows. The situation is similar in the music industry. As music services compete to offer increasingly larger catalogs of songs, the well-known artists do better, whereas each individual member of the Long Tail finds it harder to stand out. On mobile devices especially, "front end display" for music services and e-books is smaller than on desktop screens, and only the superstars get this valuable marketing real estate.

On the other hand, up-and-coming artists have fewer barriers to entry and more avenues than ever to promote themselves without the aid of major labels. For instance, musician Billie Eilish started out in the Long Tail, putting up songs on the music service SoundCloud, and has since become a major commercial success. Spotify has focused on improving the visibility of its Discover Weekly and Fresh Finds features, which connect lesser-known artists with wider audiences. And although Netflix may be driven primarily by blockbusters, it uses highly specific Long Tail categories such as "Imaginative Time Travel Movies from the 1980s" to narrow down exactly what its subscribers are interested in. One group of researchers also found that algorithms can identify "idiosyncratic" users that are more likely to respond to Long Tail search results, allowing marketers to provide Long Tail products to customers who want to see them. In certain product categories, such as consumer goods, the Long Tail has found new life as consumers increasingly go online to find specific (in many cases, local or artisanal) products that match exact needs. Walmart has used the Long Tail to better compete with Amazon in e-commerce, with a rapidly expanding product lineup available on its e-commerce website.

Both the Long Tail and the winner-take-all approaches have implications for marketers and product designers. To take a Long Tail approach, online merchants, especially those selling digital goods such as content, should build up as large a library of content as possible because they can make significant revenues from niche products that have small audiences. In contrast, to take the winner-take-all approach, firms should concentrate on hugely popular titles and services rather than niche products.

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TABLE 6.5 IMPACT OF UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY ON MARKETING

E-COMMERCE TECHNOLOGY DIMENSION	SIGNIFICANCE FOR MARKETING
Ubiquity	Marketing communications have been extended to the home, work, and mobile platforms; geographic limits on marketing have been reduced. The marketplace has been replaced by "marketspace" and is removed from a temporal and geographic location. Customer convenience has been enhanced, and shopping costs have been reduced.
Global reach	Worldwide customer service and marketing communications have been enabled. Potentially hundreds of millions of consumers can be reached with marketing messages.
Universal standards	The cost of delivering marketing messages and receiving feedback from users is reduced because of shared, global standards of the Internet.
Richness	Video, audio, and text marketing messages can be integrated into a single marketing message and consuming experience.
Interactivity	Consumers can be engaged in a dialogue, dynamically adjusting the experience to the consumer and making the consumer a co-producer of the goods and services being sold.
Information density	Fine-grained, highly detailed information on consumers' real-time behavior can be gathered and analyzed for the first time. "Data mining" Internet technology permits the analysis of terabytes of consumer data every day for marketing purposes.
Personalization/ Customization	This feature potentially enables product and service differentiation down to the level of the individual, thus strengthening the ability of marketers to create brands.
Social technology	User-generated content and social networks, along with blogs, have created large, new audiences online, where the content is provided by users. These audiences have greatly expanded the opportunity for marketers to reach new potential customers in a nontraditional media format. Entirely new kinds of marketing techniques are evolving. These same technologies expose marketers to the risk of falling afoul of popular opinion by providing more market power to users, who now can "talk back."

(in short, everywhere). Second, the Internet has increased the richness of marketing communications by combining text, video, and audio content into rich messages. Arguably, the Web is richer as a medium than even television or video because of the complexity of messages available, the enormous content accessible on a wide range of subjects, and the ability of users to interactively control the experience. Third, the Internet has greatly expanded the information intensity of the marketplace by providing marketers with unparalleled, fine-grained, detailed, real-time information about consumers as they transact in the marketplace. Fourth, the always-on, always-attached environment created by mobile devices results in consumers being much more available to receive marketing messages. One result is an extraordinary expansion in marketing opportunities for firms.

WEB TRANSACTION LOGS

transaction log
records user activity at a website

registration forms
gather personal data on name, address, phone, zip code, e-mail address, and other optional information on interests and tastes

shopping cart database
captures all the item selection, purchase, and payment data

A primary source of information about online consumers is the transaction log maintained by all web servers. A **transaction log** records user activity at a website. The transaction log is built into web server software. Transaction log data becomes even more useful when combined with two other visitor-generated data trails: registration forms and the shopping cart database. Users are enticed through various means (such as free products or special services) to fill out registration forms. **Registration forms** gather personal data on name, address, phone, zip code, e-mail address (usually required), and other information on interests and tastes. When users make a purchase, they also enter additional information into the shopping cart database. The **shopping cart database** captures all the item selection, purchase, and payment data. Other potential, additional sources of data are the information that users submit on product forms, contribute to chat groups, or send via e-mail messages using the "Contact Us" option on most sites.

For a website that has a million visitors per month and where, on average, a visitor makes 15 page requests per visit, there will be 15 million entries in the log each month. These transaction logs, coupled with data from the registration forms and shopping cart database, represent a treasure trove of marketing information for both individual sites and the online industry as a whole. Nearly all online marketing capabilities are based on these data-gathering tools. For instance, here are just a few of the interesting marketing questions that can be answered by examining a site's web transaction logs, registration forms, and shopping cart database:

- What are the major patterns of interest and purchase for groups and individuals?
- After the home page, where do most users go first, and then second and third?
- What are the interests of specific individuals (those we can identify)?
- How can we make it easier for people to use our site so that they can find what they want?
- How can we change the design of the site to encourage visitors to purchase our high-margin products?
- Where are visitors coming from (and how can we optimize our presence on these referral sites)?
- How can we personalize our messages, offerings, and products to individual users?

Businesses can choke on the massive quantity of information found in a typical site's log file. We next describe some technologies that help firms more effectively utilize this information.

SUPPLEMENTING THE LOGS: COOKIES AND OTHER TRACKING FILES

Although transaction logs create the foundation of online data collection at a single website, marketers use a variety of different types of tracking files to track web searches that users conduct, the websites and web pages visited, the online content a person has accessed, and what items that person has viewed or purchased online. Mobile apps can also track users. This monitoring and tracking take place in the background, without the user's knowledge. It is conducted not just by the individual websites that the user is visiting (known as *first-party tracking*) but also by advertising networks operated by Google, Microsoft, Meta, and a number of other companies. These advertising networks are capable of tracking personal browsing behavior across thousands of websites (known

as *third-party tracking*). In the past, website publishers and the online advertising industry defended tracking of individuals across the Web by saying that doing so allows more relevant ads to be targeted to users, which helps pay for the cost of providing online content. However, these practices also impinge on individual privacy.

Cookies are one method to monitor and track online users. A **cookie** is a small text file that allows a website to store data about the visitor on the user's computer and then later retrieve it. The cookie typically includes a unique ID number, the domain (which specifies the web server/domain that can access the cookie), a path (if a cookie comes from a particular part of a website instead of the main page, a path will be given), a security setting that indicates whether the cookie can be transmitted only by a secure server, and an expiration date (not required).

cookie
small text file that websites place on visitors' computers that allows the website to store data about the visitor on the computer and later retrieve it

A **first-party cookie** is placed on the user's computer by the same domain name as the page the user is visiting. A first-party cookie provides a company's marketing team with a very quick means of identifying customers and understanding their prior behavior at the site. Although cookie technology does not directly obtain visitors' names and addresses, if a person has registered at a site, that information can be combined with cookie data to identify the visitor. Companies also use first-party cookies to determine how many people are visiting their website, whether they are new or repeat visitors, and how often they have visited. Cookies make shopping carts and "quick checkout" options possible by allowing a site to keep track of users as they add to their shopping cart. Each item added to the shopping cart is stored in the site's database along with the visitor's unique ID value. First-party cookies can be blocked and/or deleted by users, although the majority of users do not do so.

first-party cookie
placed on the user's company by the same domain name as the page the user is visiting

A **third-party cookie** operates similarly to a first-party cookie but enables advertising platforms to track user behavior across websites and devices. In the past, third-party cookies were supported by all the major web browsers, but that has begun to change. Apple's Safari and Mozilla's Firefox browsers now block third-party cookies by default, and Google has announced that it will follow suit with its Google Chrome browser, which has more than a 65% share of the desktop web browser market in the United States, beginning in the second half of 2024.

third-party cookie
operates similarly to first-party cookies but enables advertising platforms to track user behavior across websites and devices

Web beacons are another tracking method. A **web beacon** (also called a "web bug," "clear GIF," or "tracking pixel") is a tiny (1-pixel) graphic file embedded in e-mail messages and on websites. Web beacons are used to automatically transmit information about the user and the page being viewed to a monitoring server in order to collect personal browsing behavior and other personal information. For instance, when a recipient opens an e-mail in HTML format or opens a web page, a message is sent to a server calling for graphic information. This message tells the marketer that the e-mail was opened, indicating that the recipient was at least interested in the subject header. Web beacons are not visible to users. They are often clear or white, so they are not visible to the recipient. Like cookies, Web beacons can be used for either first-party tracking or third-party tracking.

web beacon
tracking method that uses a tiny (1-pixel) graphic file embedded in e-mail messages and on websites

As previously noted, the use of third-party tracking techniques has met with increasing public and political resistance. The adoption by the European Union of the General Data Protection Regulation (GDPR) (discussed in more depth in Chapter 8) ushered in a new era of increased focus on the privacy implications of behavioral tracking. Apple has taken the lead in adopting new policies aimed at better preserving user privacy. For instance, Apple's iOS 11 and later versions include a feature called Intelligent Tracking Prevention (ITP) for its Safari browser. Safari already blocked third-party cookies by

default, but ITP extended that functionality by ensuring that first-party cookies would generally be available for only a 24-hour window after a user visited a site. Thereafter, the cookie could not be used for most forms of tracking and was deleted entirely if the user did not visit the site again within 30 days. In 2020, Apple started blocking all cookies in Safari that enable cross-site tracking, and since then, it has continued to release updated versions that further limit the ability of advertisers to track users.

The impending demise of third-party tracking has renewed online marketers' interest in user data derived from first-party tracking, a trend we further examine in *Insight on Society: Going from Third to First*.

profiling
uses a variety of tools to create a digital image for each consumer

database
a software application that stores data in the form of fields, records, and files

relational database
represents data as a two-dimensional table organized in columns and rows; data within different tables can be flexibly related as long as the tables share a common data element

database management system (DBMS)
a software application used by organizations to create, maintain, and access databases

structured query language (SQL)
industry-standard database query language used in relational databases

nonrelational (NoSQL) database
uses a more flexible data model; designed for managing large sets of structured and unstructured data that are difficult to analyze with traditional SQL-based tools

DATABASES, DATA WAREHOUSES, DATA MINING, AND BIG DATA

Databases, data warehouses, data mining, and the variety of marketing decision-making techniques loosely called *profiling* are at the heart of the revolution in online marketing. **Profiling** uses a variety of tools to create a digital image for each consumer. This image can be quite inexact, even primitive, but it can also be as detailed as a character in a novel. The quality of a consumer profile depends on the amount of data used to create it and the analytical power of the firm's software and hardware. Together, these techniques attempt to identify precisely who the online customer is and what they want and, then, to fulfill the customer's criteria exactly. These techniques are more powerful, far more precise, and more fine-grained than are the gross levels of demographic and market segmentation techniques used in mass marketing media or by telemarketing.

In order to understand the data in transaction logs, registration forms, shopping carts, cookies, web bugs, and other unstructured data sources like e-mails, tweets, and Facebook Likes, marketers need massively powerful and capacious databases, database management systems, and analytic tools.

Databases

The first step in interpreting huge transaction streams is to store the information systematically. A **database** is a software application that stores data in the form of fields, records, and files. A **relational database** represents data as two-dimensional tables with data organized in columns and rows, much like a spreadsheet. The tables—and all the data in them—can be flexibly related to one another as long as the tables share a common data element. Relational databases are extraordinarily flexible and allow marketers and other managers to view and analyze data from different perspectives very quickly.

A **database management system (DBMS)** is a software application used by organizations to create, maintain, and access databases. **Structured query language (SQL)** is an industry-standard database query and manipulation language used in relational databases. There are also several different types of **nonrelational (NoSQL) databases** that use a more flexible data model and are designed for managing large sets of structured and unstructured data, including web, social media, graphics, and other forms of data that are difficult to analyze with traditional SQL-based tools. *Blockchain*, which you learned about in Chapter 5, is a distributed database technology that enables firms and organizations to create and verify transactions on a network nearly instantaneously without a central authority. The system stores transactions as a distributed database (called a ledger) among a network of computers. The information held in the database is continually reconciled by the computers in the network.

INSIGHT ON SOCIETY

GOING FROM THIRD TO FIRST

Most e-commerce firms want to know as much personal information about their customers as possible. For years, one of the main ways online firms have obtained that information has been via third-party tracking. The use of such tracking was extensive. For instance, one study found that 90% of the top 500 websites had at least one digital tracker, while 65% had at least 10. About 20% had 50 or more, with some pulling in trackers from other sources (piggybacking). In another example, a *New York Times* reporter visited 47 sites over a period of a few days and discovered that hundreds of trackers followed him, from which an extensive amount of detail could be extracted, such as exact location browser information; and operating system details as well as the content viewed.

As consumers became more and more aware of all the data that was being collected about them, concerns grew, particularly among Millennial and Gen Z consumers. For many years, the tech industry ignored those concerns, but the passage of the European Union's General Data Protection Regulation (GDPR), followed shortly thereafter by a similar law in the state of California, has ushered in a new era. Apple was one of the first Big Tech companies to take steps to implement new policies to prevent third-party tracking via its Safari browser and iOS devices, and Google has finally announced plans to follow suit, which has been termed, somewhat dramatically, as the cookie apocalypse. As a result, companies are going to need to use new technologies and methods to obtain the kind of customer data to which they have become accustomed.

Industry experts agree that third-party tracking will not be replaced by a single solution. One thing that's clear is that companies are going to focus much more closely on "first-party" data, which is data that a company collects directly from its customers. First-party data can come from customer relationship management (CRM) systems; subscription-based e-mails; customer surveys or feedback; social media accounts; or actions customers take on a company's website or app. One of the issues with third-party tracking is that consumers often don't realize that it's happening and have not given effective informed consent. If a company has a direct relationship with the consumer, it can be more transparent about requesting and obtaining consent.

A new term coming into play is "zero-party" data. First used by Forrester Research in 2020, zero-party data is data collected from a user who actively opts into sharing data, for example, by filling out a registration form, as opposed to data that is collected from a user who is just browsing a site. But some industry experts are not so sure that this is a useful distinction because they fear that zero-party data implies that first-party data collection does not comply with privacy regulations.

Google is one of the players that has the most to lose. Perhaps not surprisingly, given the importance that online advertising, which contributes more than 90% of its revenues, has for its business model, Google resisted the elimination of third-party tracking from its Chrome browser long after Apple and the Mozilla Foundation had implemented that functionality for the Safari and Firefox browsers, respectively. Google first announced the phase-out of third-party cookies in 2020. At that time, it stated that the phase-out would begin by the second quarter of 2022. Since then, Google has postponed the phase-out twice. In June 2021, it extended the phase-out to the end of 2023, and then in July 2022, it announced a new date: the second half of 2024.

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Part of the reason for the delay is that Google needs time to evaluate and test its new "Privacy Sandbox" alternatives. One pilot underway is for an initiative it has named FLEDGE. The FLEDGE API aims to enable retargeting/remarketing and custom audiences in a way that doesn't involve third-party tracking. FLEDGE moves interest data and the decision about which ad gets presented away from third-party servers to the client's browser.

A second pilot involves an initiative that Google has named Topics, which is designed to support interest-based advertising. Topics is a less complex version of FLEDGE. With Topics API, a user's browser determines a handful of topics such as "Beauty & Fitness" or "Running & Walking" that represent the user's top interests from the previous week based on their browsing activity. When a user visits a participating site, the API will share up to three topics—one from each of the past three weeks—with websites and their advertising partners, who can use it as one of many potential signals for interest-based advertising. In the current version of the initiative, Topics will be selected locally on people's devices without involving any external servers. To limit the amount of data associated with an individual at any given time, topics will be stored for only three weeks, after which they will be deleted. Chrome will make user controls available from the start so that users can see the topics generated based on their browsing history, remove them, or opt out of the Privacy Sandbox APIs entirely. Both the FLEDGE API and the Topics API are likely to significantly evolve before being implemented.

Advertisers are also taking matters into their own hands. Data clean rooms take their name from physical clean rooms often used in manufacturing industries to prevent the risk of contamination. Data clean rooms are secure digital environments in which multiple parties can share first-party data to produce audience and marketing analytics. The technology is not totally new but is on the rise.

Data clean rooms allow for anonymized data collaboration without exposing raw data to any other party, thereby preserving consumers' privacy. For example, the Willow Bey who purchased a product from a direct-to-consumer manufacturer might be given a pseudo-anonymous identifier such as User 579 in the first-party data set. An identity graph (a database that compares data from multiple sources to create a unified profile of a customer) can match that user with the Willow Bey who purchased the same product at a department store and who is identified as User 123 in that store's database. The personal identifying information (PII) used to make the match never leaves the clean room, but the company can now recognize that the two anonymized users are the same person.

Traditional data clean rooms are based in a single physical location. Distributed data clean rooms use cloud technology: The data lives in the cloud. For example, NBCUniversal's Audience Insights Hub is a cross-cloud data clean room powered by the Snowflake platform. NBCUniversal partners can explore how audiences and customers overlap, without any underlying data being exposed from either party.

SOURCES: "Google Delays the End of Cookies (Again), from 2023 to the End of 2024," by Allison Schiff, Adexchanger.com, July 27, 2022; "Publisher Ad Monetization 2022," by Max Willens, Insider Intelligence/eMarketer, July 22, 2022; "Brands Try to Offer Consumers Personalizaton without Interfering with Privacy," by Daniel Kostantinovic, Insider Intelligence/eMarketer, July 8, 2022; "Ad Explainer: What Is First-Party Data," by Anthony Vargas, Adexchanger.com, June 2, 2022; "AdExplainer: Meet the FLEDGE API," by Allison Schiff, Adexchanger.com, April 18, 2022; "Topics: The New Privacy Sandbox Proposal for Interest-Based Advertising," by Vinay Goel, Support.google.com, February 22, 2022; "The Ultimate Guide to Data Clean Rooms," by InfoSum, 2022; "From Walled Gardens to 'Garden of Gardens," PWC, 2022; "Using a Data Clean Room for Business Growth," Snowflake.com, October 21, 2021; "I Visited 47 Sites. Hundreds of Trackers Followed Me," by Farhad Manjoo, *New York Times*, August 23, 2019; "Apple, Firefox Tools Aim to Thwart Facebook, Google Tracking," by Anick Jesdanun, Cnbc.com, September 14, 2018; "Firefox Will Soon Block Ad-Tracking Software by Default," by Nick Statt, Theverge.com, August 30, 2018; "Tracking the Trackers: Ghostery Study Reveals that 8 out of 10 Websites Spy on You," by Ghostery Team, Ghostery.com, December 4, 2017.

Data Warehouses and Data Mining

A **data warehouse** is a database that collects a firm's transactional and customer data in a single logical repository where it can be analyzed and modeled by managers without disrupting or taxing the firm's primary transactional systems and databases. The data originates in many operational areas of the firm, such as website transaction logs, shopping carts, point-of-sale terminals (product scanners) in stores, warehouse inventory levels, field sales reports, external scanner data supplied by third parties, and financial payment data. Data warehouses grow quickly into storage repositories containing terabytes (trillions of bytes) of data on consumer behavior at a firm's stores and websites. With a data warehouse, firms can answer such questions as: What products are the most profitable by region and city? What regional marketing campaigns are working? How effective is in-store promotion of the firm's website? Data warehouses can provide business managers with a more complete awareness of customers via data that can be accessed quickly.

data warehouse
a database that collects a firm's transactional and customer data in a single location for offline analysis

A **data mart** is a subset of a data warehouse in which a summarized or highly focused portion of the organization's data is placed in a separate database for a specific population of users. For example, a company might develop marketing and sales data marts to deal with customer information. A **data lake** is a repository of raw, unstructured data or structured data that for the most part has not yet been analyzed, and the data can be accessed in many ways. The data lake stores this data in its native format until it is needed.

data mart
a subset of a data warehouse in which a summarized or highly focused portion of the organization's data is placed in a separate database for a specific population of users

data lake
a repository of raw, unstructured data or structured data

Data mining is a set of analytical techniques that look for patterns in the data of a database or data warehouse or that seek to model the behavior of customers. Data can be "mined" to develop profiles of visitors and customers. A **customer profile** is simply a set of rules that describe the typical behavior of a customer or a group of customers at a website. Customer profiles help to identify the patterns in group and individual behavior that occur online as millions of visitors use a firm's website. For example, almost every financial transaction that you engage in is processed by a data mining application to detect fraud. Phone companies closely monitor your cellphone use as well to detect stolen phones and unusual calling patterns. Financial institutions and cellphone firms use data mining to develop fraud profiles. When a user's behavior conforms to a fraud profile, the transaction is not allowed or is terminated (Mobasher, 2007).

data mining
a set of analytical techniques that look for patterns in the data of a database or a data warehouse or that seek to model the behavior of customers

customer profile
a description of the typical behavior of a customer or a group of customers at a website

The Challenge of Big Data

Until recently, most data collected by organizations consisted of structured transaction data that could easily fit into rows and columns of relational database management systems. Since then, there has been an explosion of data from web traffic, e-mail messages, social media content (tweets, status messages), even music playlists, as well as machine-generated data from sensors that, due to the plummeting cost of data storage and powerful new processing capabilities, can now be stored and analyzed to draw connections and make inferences and predictions. This data may be unstructured or semi-structured and thus not suitable for relational database products that organize data in the form of columns and rows. The term **big data** refers to this avalanche of digital data that creates huge data sets, often from different sources, in the petabyte, exabyte, and even terabyte range. The volumes of data are so large that traditional DBMS

big data
huge data sets, often from different sources, in the petabyte, exabyte, and even terabyte range

cannot capture, store, and analyze the data in a reasonable time. Some examples of big data challenges are analyzing 12 terabytes of tweets generated by Twitter each day to improve understanding of consumer sentiment toward various products; analyzing 100 million e-mails in order to place appropriate ads alongside the e-mail messages; or analyzing 500 million call detail records to find patterns of fraud and churn. Digital information is growing exponentially, topping an expected 94 zettabytes worldwide in 2022. According to technology research firm IDC, data is more than doubling every two years, so the amount of data available to organizations is skyrocketing.

Marketers are interested in big data because it allows them to link huge amounts of data from a variety of different sources, which in the past they were unable to do, and to mine it for patterns of consumer behavior, with the potential to provide new insights into customer behavior, financial market activity, or other phenomena. For example, Shutterstock, the global online image marketplace, stores 200 million images and adds 55,000 more each day. To find ways to optimize the Shutterstock experience, Shutterstock analyzes its big data to find out where its website visitors place their cursors and how long they hover over an image before making a purchase. However, to derive business value from this data, organizations need new technologies and analytic tools that are capable of managing and analyzing nontraditional data along with their traditional enterprise data.

Hadoop
a software framework for working with various big data sets

To handle unstructured and semi-structured data in vast quantities, as well as structured data, many organizations are using Hadoop. **Hadoop** is an open-source software framework managed by the Apache Software Foundation that enables distributed parallel processing of huge amounts of data across inexpensive computers. It breaks a big data problem down into subproblems, distributes them among up to thousands of inexpensive computer processing nodes, and then combines the result into a smaller data set that is easier to analyze. You've probably used Hadoop to find the best airfare on the Internet, to search on Google, or to connect with a friend on Facebook.

Hadoop can process large quantities of any kind of data, including structured transactional data, loosely structured data such as Facebook and Twitter feeds, complex data such as web server log files, and unstructured audio and video data. Hadoop runs on a cluster of inexpensive servers, and processors can be added or removed as needed. Companies use Hadoop to analyze very large volumes of data as well as for a staging area for unstructured and semi-structured data before it is loaded into a data warehouse. For instance, LinkedIn runs its big data analytics on Hadoop. It now stores more than 1 exabyte of data across all its Hadoop clusters. Its largest cluster stores 500 petabytes of data and maintains 1 billion objects. eBay recently transitioned from a vendor-based data warehouse being used to store more than 20 petabytes of web analytics and transactional data, such as bids, checkouts, listings, users, and accounts, to an open-source-based Hadoop system (Shvachko et al, 2021; Samant and Steinbrugge, 2021). Top database vendors such as IBM, HP, Oracle, and Microsoft have their own Hadoop software distributions. Other vendors offer tools for moving data into and out of Hadoop or for analyzing data within Hadoop. In addition, there are many new tools being developed for big data analysis in addition to Hadoop. One example is Apache Spark. Like Hadoop, Spark splits up large tasks across different nodes. However, Spark uses random access memory (RAM) instead of a file system to cache and process data and can be much faster than Hadoop, particularly for smaller workloads. Spark also has a library of machine learning algorithms optimized for a variety of machine learning processes.

MARKETING AUTOMATION AND CUSTOMER RELATIONSHIP MANAGEMENT (CRM) SYSTEMS

Marketing automation systems are software tools that marketers use to track all the steps in the lead generation part of the marketing process. The marketing process begins with making the potential customer aware of the firm and the product. This is the beginning of a lead—someone who might buy. From there, consumers need to find you as they search for products; they will compare your products with your competitors' offerings and at some point, choose to purchase. Software can help in each of these stages. A number of firms sell software packages that can visualize most of the online marketing activities of a firm and then track the progression from exposure to display ads, finding your firm on a search engine, directing follow-up e-mail and other communications, and finally a purchase. Once leads become customers, customer relationship management systems take over the maintenance of the relationship.

marketing automation systems
software tools that marketers use to track all the steps in the lead generation part of the marketing process

Customer relationship management systems are another important online marketing technology. A **customer relationship management (CRM) system** is a repository of customer information that records all the contacts that a customer has with a firm (including websites) and generates a customer profile available to everyone in the firm who has a need to "know the customer." CRM systems also supply the analytical software required to analyze and use customer information. Customers come to firms not just over the Web but also via telephone call centers, customer service representatives, sales representatives, automated voice response systems, ATMs and kiosks, in-store point-of-sale terminals, and mobile devices (m-commerce). Collectively, these are referred to as "**customer touch points**." In the past, firms generally did not maintain a single repository of customer information; instead, information was organized along product lines, with each product line maintaining a customer list (and often not sharing the list with others in the same firm).

customer relationship management (CRM) system
a repository of customer information that records all of the contacts that a customer has with a firm and generates a customer profile available to everyone in the firm who has a need to "know the customer"

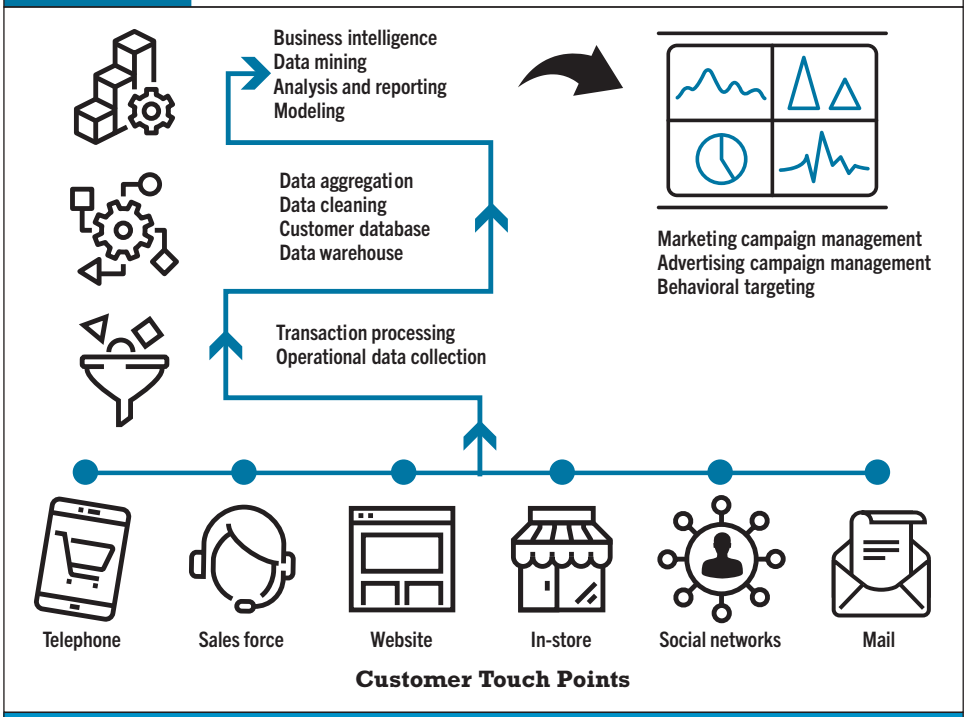
customer touch points
the ways in which customers interact with the firm

In general, firms did not know who their customers were, how profitable they were, or how they responded to marketing campaigns. For instance, a bank customer might see a television advertisement for a low-cost auto loan that included an 800-number to call. However, if the customer went to the bank's website instead of calling the 800-number, marketers would have no idea how effective the television campaign was because this web customer contact data was not related to the 800-number call center data. **Figure 6.9** illustrates how a CRM system integrates customer contact data into a single system.

CRMs are part of the evolution of firms toward a customer-centric and marketing-segment–based business and away from a product-line–centered business. CRMs are essentially a database technology with extraordinary capabilities for addressing the needs of each customer and differentiating the product or service on the basis of treating each customer as a unique person. Customer profiles can contain the following information:

- A map of the customer's relationship with the organization
- Product and usage summary data
- Demographic and psychographic data
- Profitability measures

FIGURE 6.9 A CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM



This is an example of a CRM system. The system captures customer information from all customer touch points as well as other data sources, merges the data, and aggregates it into a single customer data repository or data warehouse, where it can be used to provide better service as well as to construct customer profiles for marketing purposes. Online analytical processing (OLAP) allows managers to dynamically analyze customer activities to spot trends or problems involving customers. Other analytical software programs analyze aggregate customer behavior to identify profitable and unprofitable customers as well as customer activities.

- Contact history, summarizing the customer's contacts with the organization across most delivery channels
- Marketing and sales information containing programs received by the customer and the customer's responses
- E-mail campaign responses
- Website visits
- Mobile app downloads

With these profiles, CRMs can be used to sell additional products and services, develop new products, increase product utilization, reduce marketing costs, identify and retain profitable customers, optimize service delivery costs, retain high lifetime value customers, enable personal communications, improve customer loyalty, and increase product profitability. The goal is what is known as a "360-degree" view that enables a company to know what its customers buy, how they browse, what kinds of communications and offers will engage them, and more. Leading CRM vendors include Oracle, SAP,

Microsoft, Salesforce, and SugarCRM, many of which offer cloud-based versions of their CRM products. One issue facing cloud CRM providers and global companies that use those products is European Union data regulations that require companies to reassess how they use CRM data to avoid violating those regulations. All the major vendors offer cloud-based SaaS CRM applications.

6.4 UNDERSTANDING THE COSTS AND BENEFITS OF ONLINE MARKETING COMMUNICATIONS

As we noted earlier, although spending on online advertising now accounts for about 70% of total advertising spending, concerns still remain about how well online advertising really works and about how to adequately measure the costs and benefits of online advertising. We will address both of these topics in this section. But first, we will define some important terms used when examining the effectiveness of online marketing.

ONLINE MARKETING METRICS: LEXICON

In order to understand the process of attracting prospects via marketing communications and converting them into customers, you will need to be familiar with online marketing terminology. **Table 6.6** lists some terms commonly used to describe the impacts and results of "traditional" online marketing such as display ads and e-mail campaigns. Metrics for social, mobile, and local marketing are covered in Chapter 7.

The first nine metrics focus primarily on the success of a website in achieving audience or market share by "driving" shoppers to the site. These measures often substitute for solid information on sales revenue as e-commerce entrepreneurs seek to have investors and the public focus on the success of the website in attracting visitors.

Impressions are the number of times an ad is served. **Click-through rate (CTR)** measures the percentage of people exposed to an online advertisement who actually click on the advertisement. Because not all ads lead to an immediate click, the industry has invented a term for a long-term hit called **view-through rate (VTR)**, which measures the 30-day response rate to an ad. **Hits** are the number of HTTP requests received by a firm's server. Hits can be misleading as a measure of website activity because a "hit" does not equal a page. A single page may account for several hits if the page contains multiple images or graphics. A single website visitor can generate hundreds of hits. For this reason, hits are not an accurate representation of web traffic or visits, even though they are generally easy to measure; the sheer volume of hits can be huge—and sound impressive—but not be a true measure of activity. **Page views** are the number of pages requested by visitors. However, with the increased usage of web frames that divide pages into separate sections, a single page that has three frames will generate three page views. Hence, page views per se are also not a very useful metric.

Viewability rate is the percentage of ads (either display or video) that are actually seen by people online. We further discuss the issue of viewability later in this section.

The number of unique visitors is perhaps the most widely used measure of a website's popularity. The measurement of **unique visitors** counts the number of distinct, unique visitors to a website, regardless of how many pages they view. **Loyalty** measures

impressions
number of times an ad is served

click-through rate (CTR)
percentage of people exposed to an online advertisement who actually click on the banner

view-through rate (VTR)
measures the 30-day response rate to an ad

hits
number of HTTP requests received by a firm's server

page views
number of pages requested by visitors

viewability rate
percentage of ads that are actually seen by people online

unique visitors
number of distinct, unique visitors to a site

loyalty
percentage of purchasers who return in a year

TABLE 6.6 MARKETING METRICS LEXICON

DISPLAY AD METRICS	DESCRIPTION
Impressions	Number of times an ad is served
Click-through rate (CTR)	Percentage of times an ad is clicked
View-through rate (VTR)	Percentage of times an ad is not clicked immediately but the website is visited within 30 days
Hits	Number of HTTP requests
Page views	Number of pages viewed
Viewability rate	Percentage of ads that are actually seen online
Unique visitors	Number of unique visitors in a period
Loyalty	Measured variously as the number of page views, the frequency of single-user visits to the website, or the percentage of customers who return to the site in a year to make additional purchases
Reach	Percentage of website visitors who are potential buyers; or the percentage of total market buyers who buy at a site
Recency	Time elapsed since the last action taken by a buyer, such as a website visit or a purchase
Stickiness (duration)	Average length of stay at a website
Acquisition rate	Percentage of visitors who indicate an interest in the website's products by registering or visiting product pages
Conversion rate	Percentage of visitors who become customers
Browse-to-buy ratio	Ratio of items purchased to product views
View-to-cart ratio	Ratio of "Add to cart" clicks to product views
Cart conversion rate	Ratio of actual orders to "Add to cart" clicks
Checkout conversion rate	Ratio of actual orders to checkouts started
Abandonment rate	Percentage of shoppers who begin a shopping cart purchase but then leave the website without completing a purchase (similar to checkout conversion rate)
Retention rate	Percentage of existing customers who continue to buy on a regular basis (similar to loyalty)
Attrition rate	Percentage of customers who do not return during the next year after an initial purchase
VIDEO ADVERTISING METRICS	
View time	How long the ad actually stays in view while it plays
Completion rate	How many viewers watched the complete video
Skip rate	How many viewers skipped the video
E-MAIL METRICS	
Open rate	Percentage of e-mail recipients who open the e-mail and are exposed to the message
Delivery rate	Percentage of e-mail recipients who received the e-mail
Click-through rate (e-mail)	Percentage of recipients who clicked through to offers
Bounce-back rate	Percentage of e-mails that could not be delivered
Unsubscribe rate	Percentage of recipients who click "Unsubscribe"
Conversion rate (e-mail)	Percentage of recipients who actually buy

the percentage of visitors who return in a year. This can be a good indicator of a site's web following and perhaps of the trust shoppers place in a site. **Reach** is typically a percentage of the total number of consumers in a market who visit a website; for example, 10% of all book purchasers in a year will visit Amazon at least once to shop for a book. This provides an idea of the power of a website to attract market share. **Recency**—like loyalty—measures the power of a website to encourage repeat visits and is generally measured as the average number of days elapsed between shopper or customer visits. For example, a recency value of 25 days means that the average customer will return once every 25 days.

Stickiness (sometimes called *duration*) is the average length of time visitors remain at a website. Stickiness is important to marketers because the longer the amount of time a visitor spends at a website, the greater the probability of a purchase. However, equally important is what people do when they visit a website and not just how much time they spend there.

The metrics described so far do not say much about commercial activity nor help you understand the conversion from visitor to customer. Several other measures are more helpful in this regard. **Acquisition rate** measures the percentage of visitors who register or visit product pages (indicating interest in the product). **Conversion rate** measures the percentage of visitors who actually purchase something. Conversion rates can vary widely, depending on the success of the site and the device used. Websites viewed on traditional desktops/laptops and tablets are the most effective vehicle for converting visitors into purchasers, each with a conversion rate of about 3%. Conversion rates on smartphones lag behind, at 2% (Kibo Commerce, 2022). The **browse-to-buy ratio** measures the ratio of items purchased to product views. The **view-to-cart ratio** calculates the ratio of "Add to cart" clicks to product views. **Cart conversion rate** measures the ratio of actual orders to "Add to cart" clicks. **Checkout conversion rate** calculates the ratio of actual orders to checkouts started. **Abandonment rate** measures the percentage of shoppers who begin a shopping cart form but then fail to complete the form and leave the website. Abandonment rates can signal a number of potential problems—poor form design, lack of consumer trust, or consumer purchase uncertainty caused by other factors. According to Salesforce.com, which gathers data from more than 1 billion shoppers worldwide who interact with more than 2,200 sites, in the second quarter of 2022 the average abandonment rate in the United States was the lowest, at 75%, for shopping carts accessed via desktops/laptops, followed by shopping carts accessed via tablets at 80%. Shopping carts accessed via smartphones had the highest abandonment rates, at almost 85% (Salesforce.com, 2022). Among the reasons for abandonment are security concerns, customers just checking prices, inability of customers to find customer support, inability of customers to find preferred payment option, and the item being unavailable at checkout. Given that more than 80% of online shoppers generally have a purchase in mind when they visit a website, a high abandonment rate signals many lost sales. **Retention rate** indicates the percentage of existing customers who continue to buy on a regular basis. **Attrition rate** measures the percentage of customers who purchase once but never return within a year (the opposite of loyalty and retention rates).

Specific types of advertising have their own special metrics. For instance, for video ads, **view time** (how long the ad actually stays in view while it plays) and **completion rate** (how many viewers watch the entire video ad) are important factors (Extreme Reach, 2022). Brand recall is significantly higher when the entire ad is watched, making the completion rate metric more meaningful to advertisers than the click-through rate.

reach
percentage of the total number of consumers in a market who will visit a site

recency
average number of days elapsed between visits

stickiness (duration)
average length of time visitors remain at a site

acquisition rate
percentage of visitors who register or visit product pages

conversion rate
percentage of visitors who purchase something

browse-to-buy ratio
ratio of items purchased to product views

view-to-cart ratio
ratio of "Add to cart" clicks to product views

cart conversion rate
ratio of actual orders to "Add to cart" clicks

checkout conversion rate
ratio of actual orders to checkouts started

abandonment rate
% of shoppers who begin a shopping cart, but then fail to complete it

retention rate
% of existing customers who continue to buy

attrition rate
% of customers who purchase once, but do not return within a year

view time
how long the video ad actually stays in view while it plays

completion rate
how many viewers watch the complete video ad

open rate
% of customers who open e-mail

delivery rate
% of e-mail recipients who received e-mail

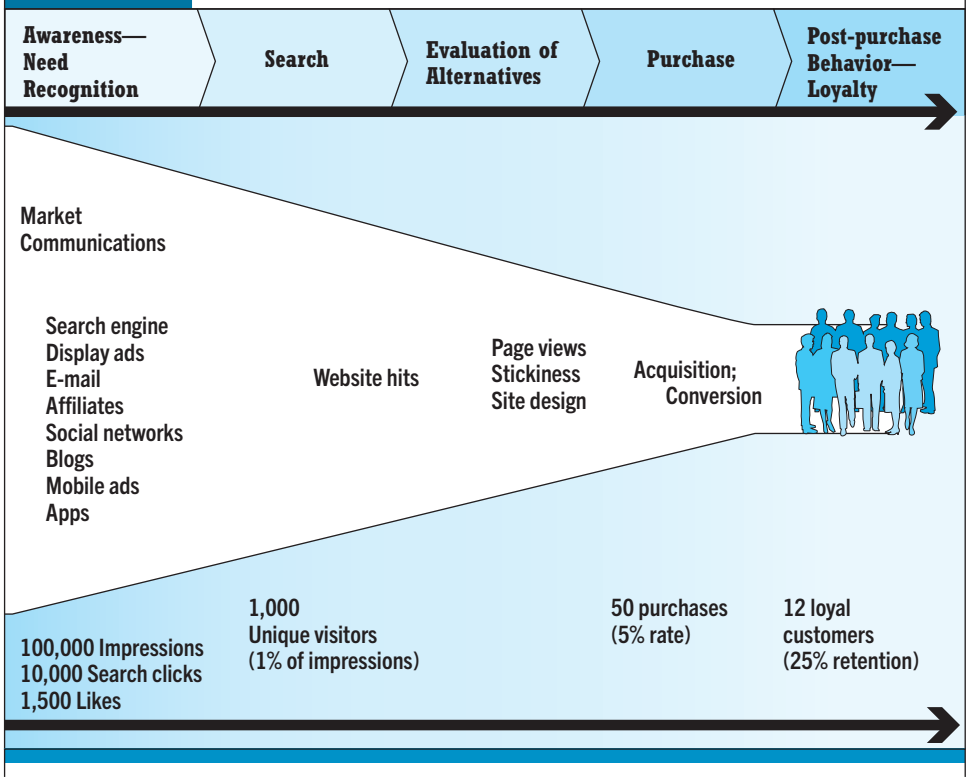
click-through rate (e-mail)
% of e-mail recipients who clicked through to the offer

bounce-back rate
percentage of e-mails that could not be delivered

E-mail campaigns also have their own set of metrics. **Open rate** measures the percentage of customers who open the e-mail and are exposed to the message. Generally, open rates are quite high, in the area of 50% or greater. However, some browsers open mail as soon as the mouse cursor moves over the subject line, and therefore this measure can be difficult to interpret. **Delivery rate** measures the percentage of e-mail recipients who received the e-mail. **Click-through rate (e-mail)** measures the percentage of e-mail recipients who clicked through to the offer. Finally, **bounce-back rate** measures the percentage of e-mails that could not be delivered.

There is a lengthy path from simple online ad impressions, website visits, and page views to the purchase of a product and the company making a profit (see **Figure 6.10**). You first need to make customers aware of their needs for your product and somehow drive them to your website. Once there, you need to convince them that you have the best value—quality and price—when compared to alternative providers. You then must persuade them to trust your firm to handle the transaction (by providing a secure environment and fast fulfillment). Based on your success, a percentage of customers will remain loyal and purchase again or will recommend your website to others. View the Figure 6.10 video in the eText for an animated and more detailed discussion of this figure.

FIGURE 6.10 AN ONLINE CONSUMER PURCHASING MODEL



The conversion of visitors into customers, and then into loyal customers, is a complex and long-term process that may take several months.

HOW WELL DOES ONLINE ADVERTISING WORK?

What is the most effective kind of online advertising? How does online advertising compare to offline advertising? The answers depend on the goals of the campaign, the nature of the product, and the quality of the website you direct customers toward. The answers also depend on what you measure. Click-through rates are interesting, but ultimately, it's the return on the investment (ROI) in the ad campaign that counts. Complicating matters is the difficulty of **cross-platform attribution**, which involves understanding how to assign appropriate credit to different marketing initiatives on a variety of platforms that may have influenced a consumer along the way to an ultimate purchase. There is increasing recognition that first-click and last-click models—which focus, as their names indicate, on either the first or the last marketing channel or advertising format that a consumer engages with prior to a purchase—are no longer sufficient. For instance, in 2021, Google announced that it was updating its ad attribution model. Instead of relying solely on consumers' last-click, it will also employ a data-driven attribution model based on machine learning to assess data from throughout the entire conversion pipeline (Clark, 2021). The phase-out of third-party tracking, which historically has provided the underpinnings of the online measurement and attribution infrastructure (by making it easier to know when a consumer had been served an ad in one place and then made a related purchase somewhere else), will also pose new challenges.

cross-platform attribution
understanding how to assign appropriate credit to different marketing initiatives that may have influenced a consumer on the way to a purchase

Click-through rates for various types of online marketing communications tools vary and are a function of personalization and other targeting techniques. E-mail marketing in-house lists (permissions e-mail) typically have the highest CTR, in the 3%–5% range. Putting the recipient's name in the subject line can double the click-through rate. (For unsolicited e-mail and outright spam, response rates are much lower). Although the average Google search listing ad click-through rate is around 3%, some merchants can hit 10% or more by making their ads more specific and attracting only the most interested people (Chaffey, 2022). The click-through rate for video ads (typically between 0.15% and 0.45%) may seem low, but it is twice as high as the rate (0.05%) for banner ads.

How effective is online advertising compared to offline advertising? In general, the online channels (e-mail, search engine, display ads, video, and social, mobile, and local marketing) compare very favorably with traditional channels. This explains in large part why online advertising has grown so rapidly in the last five years. Search engine advertising has grown to be one of the most cost-effective forms of marketing communications and accounts for, in large part, the growth of Google. Direct opt-in e-mail is also very cost-effective. This is, in part, because e-mail lists are so inexpensive and because opt-in e-mail is a form of targeting people who are already interested in receiving more information.

A study of the comparative impacts of offline and online marketing concluded that the most powerful marketing campaigns used multiple forms of marketing, including online, catalog, television, radio, newspapers, and retail store. Traditional media like television and print media remain the primary means for consumers to find out about new products even though advertisers have reduced their budgets for print media ads. Consumers who shop multiple channels are spending more than consumers who shop with only a single channel, in part because they have more discretionary income but also because of the combined number of "touch points" that marketers are making with the consumers. The fastest-growing channel in consumer marketing is the multi-channel shopper.

TABLE 6.7 DIFFERENT PRICING MODELS FOR ONLINE ADVERTISEMENTS

PRICING MODEL	DESCRIPTION
Barter	Exchange of ad space for something of equal value
Cost per thousand (CPM)	Advertiser pays for impressions in 1,000-unit lots
Cost per click (CPC)	Advertiser pays prenegotiated fee for each click ad received
Cost per lead (CPL)	Advertiser pays only for qualified leads or contacts
Cost per action (CPA)	Advertiser pays only for those users who perform a specific action, such as registering, purchasing, etc.
Hybrid	Two or more of these models used together
Sponsorship	Term-based; advertiser pays fixed fee for a slot on a website

THE COSTS OF ONLINE ADVERTISING

cost per thousand (CPM) advertiser pays for impressions in 1,000-unit lots

cost per click (CPC) advertiser pays prenegotiated fee for each click an ad receives

cost per action (CPA) advertiser pays only for those users who perform a specific action

Effectiveness cannot be considered without an analysis of costs. Initially, most online ads were sold on a barter or **cost per thousand (CPM)** impressions basis, with advertisers purchasing impressions in 1,000-unit lots. (As viewability becomes increasingly important to advertisers, some are paying on a vCPM [viewable CPM basis]; i.e., per 1,000 impressions that were in view.) Today, other pricing models have developed, including **cost per click (CPC)**, in which the advertiser pays a prenegotiated fee for each click an ad receives; **cost per action (CPA)**, in which the advertiser pays a prenegotiated amount only when a user performs a specific action, such as registering or purchasing; and hybrid arrangements, combining two or more of these models (see **Table 6.7**).

Although in the early days of e-commerce, a few online sites spent as much as $400 on marketing and advertising to acquire one customer, the average cost was never that high. While the costs for offline customer acquisition are higher than online costs, the offline items are typically far more expensive. If you advertise in the *Wall Street Journal*, you are tapping into a wealthy demographic that may be interested in buying islands, jets, and expensive homes in France. A full-page color ad in the *Wall Street Journal* National Edition costs about $250,000, whereas other papers charge in the $10,000 to $100,000 range.

One of the advantages of online marketing is that online sales can generally be directly correlated with online marketing efforts. If online merchants can obtain offline purchase data from a data broker, the merchants can measure precisely just how much revenue is generated by specific banners or e-mail messages sent to prospective customers. One way to measure the effectiveness of online marketing is by looking at the ratio of additional revenue received divided by the cost of the campaign (Revenue/Cost). Any positive whole number means the campaign was worthwhile.

A more complex situation arises when both online and offline sales revenues are affected by an online marketing effort. A large percentage of the online audience uses the Web to "shop" but not buy. These shoppers buy at physical stores. Merchants such as Target and Walmart use e-mail to inform their registered customers of special offers available for purchase either online or at stores. Unfortunately, purchases at physical

stores cannot be tied precisely with the online e-mail campaign. In these cases, merchants have to rely on less precise measures such as customer surveys at store locations to determine the effectiveness of online campaigns.

In either case, measuring the effectiveness of online marketing communications—and precisely specifying the objective (branding versus sales)—is critical to profitability. To measure marketing effectiveness, you need to understand the costs of various marketing media and the process of converting online prospects into online customers.

In general, the costs for typical online marketing communications are much less expensive than the costs for offline marketing communications. For instance, in 2022, the average cost for 30 seconds of commercial time during a prime-time network television broadcast is about $105,000 (not including the cost to produce the advertisement), although the cost could be much higher or lower, depending on the time slot. Average cost per thousand (CPM) for television ads depends in part on the market in which they are shown and typically vary from $15 to $35. In contrast, a banner ad costs virtually nothing to produce and can be purchased for a cost of $5–$10 per thousand impressions. Direct postal mail can cost 80 cents to $1 per household for a post card, whereas e-mail can be sent for virtually nothing and costs only $5–$15 per thousand targeted names. Hence, e-mail is far less expensive than postal mail on a CPM basis. **Effective cost-per-thousand (eCPM)** is a metric that measures return on investment from an ad by dividing the total earnings from the ad by the total number of impressions in thousands.

effective cost-per-thousand (eCPM) measures return on investment from an ad by dividing the total earnings from the ad by the total number of impressions in thousands

MARKETING ANALYTICS: SOFTWARE FOR MEASURING ONLINE MARKETING RESULTS

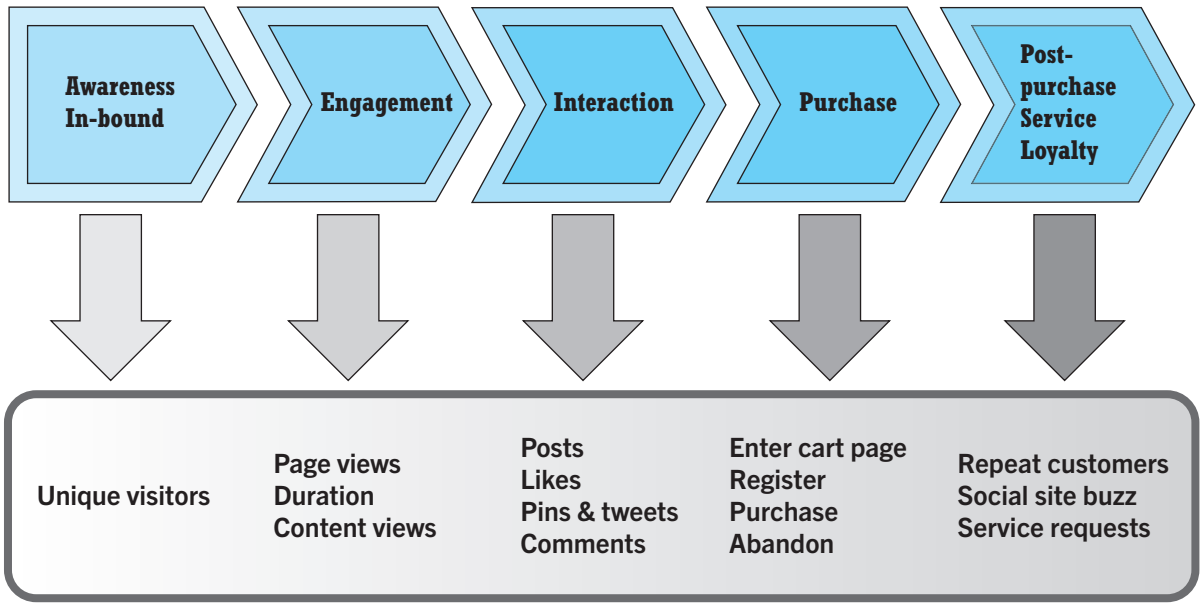
A number of software programs are available to automatically calculate activities at a website or on a mobile device. Tracking the viewing and behavior of consumers across myriad devices and media channels is a much more difficult task. Other software programs and services assist marketing managers in identifying exactly which marketing initiatives are paying off and which are not.

The purpose of marketing is to convert shoppers into customers who purchase what you sell. The process of converting shoppers into customers is often called a "purchasing funnel." We have characterized this as a process, rather than a funnel, that is composed of several stages: awareness, engagement, interaction, purchase, and post-purchase service and loyalty. **Marketing analytics software** collects, stores, analyzes, and graphically presents data on each of the stages in the conversion of shoppers to customers (see **Figure 6.11**).

marketing analytics software collects, stores, analyzes, and graphically presents data on each of the stages in the conversion of shoppers to customers on e-commerce sites

Marketing analytics packages can tell business managers how people become *aware* of their site, and where they come from (e.g., search, self-entered URL, e-mail, social campaigns, or offline traditional print and TV ads), along with demographic, behavioral, and geographic information. Are shoppers coming from mobile devices, Facebook, or Pinterest? This information can help managers decide the best ways to drive traffic, the so-called "in-bound" links to a site. Once visitors have arrived at the website, analytics packages can record how *engaged* they are with the site's content, measured in terms of pages viewed and duration on site. This information can allow managers to change the design of the site or change the content viewers are seeing. For instance, video

FIGURE 6.11 MARKETING ANALYTICS AND THE ONLINE PURCHASING PROCESS



Marketing analytics help e-commerce firms to better understand consumer behavior at each stage of the online purchasing process.

testimonials from product users may be much more engaging than expert reviews or user text comments. In a social marketing world, where consumers' opinions and behavior can be harvested and broadcast to their friends, an important intermediate step in the consumer conversion process is to encourage visitors to *interact* with content and share their experiences, opinions, preferences, and behaviors with their friends as well as other visitors to the site. Marketing analytics packages can track visitor interaction and help managers decide what content leads to higher levels of visitor interaction with friends and other visitors. The *purchase activity* on the shopping cart page is a major focus of analytics tools not just because this is where the revenue is generated but also because this is where the customer frequently exits the entire site and the firm loses a potential sale. The current shopping cart abandonment rate in the United States is about 75% for shopping carts accessed via desktop/laptop, 80% for shopping carts accessed via a tablet, and 85% for a shopping cart accessed on a smartphone (Salesforce.com, 2022). This seems like an extraordinary rate, but, like most of the indicators discussed in this chapter, abandonment is a complex phenomenon and often not what it seems. Some consumers use carts like a shopping list and don't complete the transaction immediately; some use it for price comparison and to know shipping costs or taxes; others begin a transaction on one device and complete it later on a different device. Another measure of near-purchase activity is the add-to-cart rate. Marketing analytics software can help managers tease out the meaning of behavior on a website's shopping cart page. Finally, marketing analytics can help managers discover customer loyalty and post-purchase

behavior. In an increasingly social marketing environment, marketing managers need to know how their products and services are being talked about on other sites, Facebook pages, Instagram Stories, or Twitter tweets, often called "buzz" or sentiment analysis. Are the comments positive or negative? What is the source of negative comments? Possible candidates are poor quality, high costs, poor warranty service, and shipping issues.

The end objective of marketing analytics packages is to help business managers optimize the return on investment on their marketing efforts and to do this by building a detailed understanding of how their consumers behave. Marketing analytics also allow managers to measure the impact of specific marketing campaigns involving, say, discounts, loyalty points, and special offers as well as regional, or demographic-based, campaigns. Aside from its role in enhancing management decision making and optimizing the effectiveness of building an e-commerce presence, marketing analytics packages also enable a near-real-time marketing capability in which managers are able to change the content of a website, respond to customer complaints and comments, and align campaigns with trending topics or news developments, all in a near-real-time manner (real time may be a matter of minutes or at most 24 hours).

Although there are a great many marketing analytics firms and software packages on the market, the leaders are Google Analytics, Adobe Analytics, IBM Digital Analytics, and Webtrends.

6.5 CAREERS IN E-COMMERCE

As you've learned in this chapter, the online advertising industry is one of the most robust and fastest-growing sectors of the online economy. There are positions (similar to the one detailed in this section), within companies within the online advertising industry itself, and also with companies such as Google, Meta, Amazon, and others, that provide the platform for online advertisements.

THE COMPANY

The company is a startup organic food grocer based in Maryland, where it started as a single grocery store selling organic and locally farmed foods in 2008. Today the firm operates 110 total retail stores in the Northeast and has more than 15,000 employees. The company provides customers with a one-stop shop for organic produce, raw dairy, humanely raised meats, gourmet items, baked goods, supplements, and household items. It recently started a non-GMO labeling program so that customers can tell whether food contains genetically modified ingredients. The firm has begun a major effort to build an online presence with a new website and social marketing efforts and is considering online ordering and on-demand delivery of organic foods to its affluent, young customer base.

Sales of organic foods have exploded in the United States and worldwide. In 2021, organic product sales hit $57 billion in the United States. Organic products are now available in nearly 20,000 natural foods stores and about 75% of conventional grocery stores.

THE POSITION: DIGITAL MARKETING ASSISTANT

You will work with the Marketing Team to communicate with customers and vendors using digital marketing tools to enhance brand engagement, education, and online customer service. Your role will include:

- Collaborating with the Marketing Team's promotional calendar for digital, print, and in-store marketing materials.
- Creating supplemental content for the company's blog, website, e-mail newsletters, and social media accounts.
- Updating the company's website with new content, implementing SEO, and monitoring all web activity.
- Updating the company's social media accounts: Facebook, TikTok, Twitter, Pinterest, and Instagram.
- Researching social media developments and trends.
- Working with Store Managers, Category Managers, and other team members to plan and facilitate store, team member, and product-specific posts.
- Responding and managing customer reviews posted online (on Yelp, Google, etc.).
- Generating monthly reports that analyze the success of digital marketing efforts.

QUALIFICATIONS/SKILLS

- Undergraduate degree in the humanities or social sciences, with course work in MIS, e-commerce, digital marketing, statistics, web design, or social media
- Familiarity with WordPress, Meta for Business, Meta Ads Manager, TikTok, Instagram, Pinterest, Twitter, Hootsuite, Sprout Social, Google Analytics, Yelp for Businesses, and Microsoft Office
- Excellent verbal and written communication skills
- Copywriting and editing expertise
- Experience or background in customer service
- Photography and basic photo editing skills
- Understanding of search engine optimization
- Ability to multi-task and work in a fast-paced environment
- Good time management skills
- Ability to work independently and as part of a team
- Knowledge about and familiarity with food/ingredient sourcing, health and wellness, sustainable agriculture, organic foods, and current news/trends in the natural foods industry is a plus!

PREPARING FOR THE INTERVIEW

This chapter provides foundational material that you should be familiar with as you embark on interviewing for a position in the online marketing and advertising industry. Begin by reviewing Section 6.1, so that you can demonstrate that you have some knowledge of the demographics of the Internet audience and online consumer behavior,

particularly the consumer decision process (Figure 6.2). Section 6.2 provides an overview for you of digital marketing and advertising strategies and tools. You should be prepared to show that you are familiar with the wide variety of online marketing and advertising tools, such as search engine marketing and advertising, display advertising in its different formats (banner ads, rich media, video ads, content marketing, and native advertising as well as the use of programmatic advertising networks), e-mail marketing, affiliate marketing, and also social, mobile, and local marketing, as well as with various customer retention and pricing strategies. You can also impress your interviewer by indicating awareness of some of the issues associated with the different types of online advertising, such as ad fraud, viewability, and the increasing use of ad blocking software. Although this particular position is not a technical one, it would also be worthwhile to review the various online marketing technologies discussed in Sections 6.3 as well as Section 6.4 so that you can demonstrate that you have some familiarity with the costs and benefits of online marketing communications. Pay particular attention to the online marketing metrics lexicon (Table 6.6), as you will want to show that you have some basic knowledge about how the effectiveness of online advertising is measured as well as some of the issues surrounding the topic, such as the difficulties of cross-platform attribution.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. What do you think are some of the advantages of developing an online channel for branding and direct sales rather than using traditional media such as print advertising or television?

You can suggest that online marketing is more effective than traditional channels because people are spending more and more time online than ever before to view content, to find out information on products, and to purchase products. An online presence means that customers can not only view an ad but also make a purchase at nearly the same time. This is far more convenient for the customer than reading a newspaper ad, or watching a TV show, and then driving to a store for the actual purchase. It's all about the customer experience and making it as easy as possible to purchase products.

2. Do you think the Internet and social networks are a good way to promote organic products and generate direct sales as well as to drive more customers to our stores?

You can suggest that the largest market for organic foods is young professionals and that this demographic group is also very active on social networks and familiar with ordering goods and food online.

3. Word of mouth is a very powerful marketing tool. How do you think we can achieve more effective word-of-mouth online marketing?

You can suggest that online marketing and advertising involves contacting customers who are already a part of social networks like Facebook, Twitter, and others. Many are members of online self-help networks as well. The online audience is highly connected to others in family, professional, and interest networks. You will be marketing to existing social networks as much as to individuals.

4. Besides websites and social networks, what other online marketing channels should we be focusing on that would be effective for our target audience?

You can suggest that display ads and search engine ads might be effective for organic food products. Display ads would work well if you can identify what other websites your customers go to for news, entertainment, and information and then place display ads on those sites. Programmatic advertising networks could help the firm find those sites and place the ads. For instance, search engine ads can be placed in response to queries about health issues.

5. Do you think our customers would be interested in home delivery of organic foods?

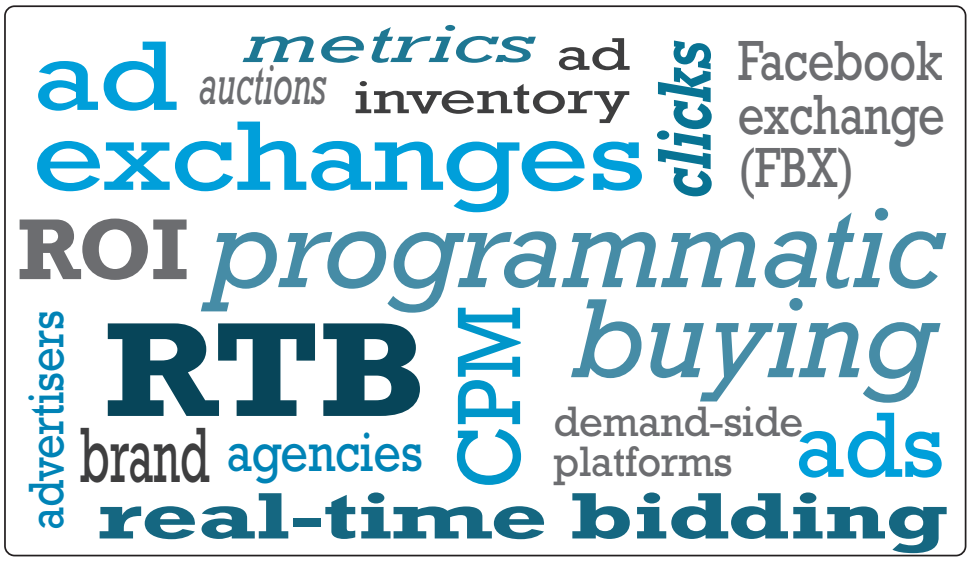
You could suggest that if the products could be ordered and delivered on the same day and are just as fresh as in-store products, then, yes, on-demand, same-day delivery would be very attractive to young families, particularly those in which both parents work.

6.6 CASE STUDY

Programmatic Advertising: Real-Time Marketing

The holy grail of advertising and marketing is delivering the right message to the right person at the right time. If doing so were possible, no one would receive ads they did not want to see, and no advertising dollars would be wasted, reducing the costs to end users and increasing the efficiency of each ad dollar. In the physical world, only a very rough approximation of this ideal is possible. Advertisers buy television and radio spots, newspaper ads, and billboards based on broad demographics and on the context in which the ads will be shown.

The Internet promised to change this traditional method of buying ad space by allowing advertisers to gather personal information on consumers through the use of cookies placed on the user's browser, which tracked behavior and purchases online and could be matched with offline information as well. Advertisers could then use this information to target ads to just the desired individuals they were seeking based on personal characteristics, interests, and recent clickstream behavior. From the beginning, e-commerce was a trade-off for consumers between privacy and efficiency: Let us know more about you, and we will show you only the advertising and products you are interested in seeing and would be likely to respond to. For brands, the promise was scale and cost: Let us know whom you are looking for, and we will find millions of people on thousands of websites that fit your criteria. E-commerce was supposed to end the mass



advertising that began in nineteenth-century newspapers, expanded with twentieth-century radio, and then exploded with the growth of television.

The latest rendition of these promises from the ad tech industry is programmatic advertising, which it touts as an automated algorithmic platform that allows large brands to bid for ad space (web pages) on hundreds of thousands, and even millions, of websites in coordinated campaigns, to measure the results, and to extend brands to tens of millions of consumers with unprecedented scale. In 2022, various kinds of programmatic digital display advertising spending (including video, native advertisements, and social network advertising) on all platforms is expected to amount to almost $130 billion, accounting for more than 90% of total digital display advertising spending. But in the past few years, it has become clear that the promise of programmatic advertising has not been realized and has many risks for brands. In fact, this kind of advertising has injured many brands, and the ad tech industry is reeling from advertiser criticism that the existing online ad ecosystem lacks transparency, fails to protect brands, is rife with fraudulent clicks by bots, and lacks metrics for judging the cost effectiveness of ads.

Contrary to the rosy promises of the online ad industry, most notably those of the ad giants Google, Meta, and Twitter, most of the display ads shown to website visitors are irrelevant, sometimes hilariously so, to visitors' interests. For this reason, the click-through rate for banner advertising is stunningly low, around 0.05%, and the price of generic display ads is only about $1.50 per thousand views because of their low response rate. Try this out: Visit Yahoo (one of the largest display advertisers on Earth) on any device, look at the prominent ads on screen, and ask yourself whether you are really interested in the ad content at that moment in time. Often, it is an ad for something you have recently searched for on Google or even already purchased at Amazon or other sites. These ads will follow you for days as you are re-targeted across the Web and on mobile devices. Researchers have found that only 20% of Internet users find that display ads on websites are relevant to their interests, and depending on the type of ad (sidebar, native inline, pre-roll video, or video and display ads) are viewed unfavorably by 50% to 78% of visitors. How many times a day do you click the X to stop a video roll on the top of the screen?

To understand how we ended up in this situation, it's useful to review briefly how the Internet ad industry evolved. Digital display advertising has progressed through three eras. In the early 2000s, a firm with a website interested in ad revenue (a "publisher") would sell space on its site to other firms (advertisers), usually through an ad agency or via a direct relationship. The process was primarily manual. By 2005, ad networks emerged. These networks allowed advertisers to buy ad space on thousands of participating sites in a single purchase and allowed publishers to sell to advertisers more efficiently. Prices were negotiated among the parties. This process was very similar to the manner in which ads on cable TV were sold. By 2011, even larger ad exchanges emerged and began using automated real-time bidding for ad space, which provided advertisers with access to an even larger pool of publisher ad spaces that numbered up to the millions of websites. Prices and ad placement were automated by algorithms and adjusted based on real-time open auctions, in which advertising firms and brands indicated what they were willing to pay to advertise to consumers meeting specific criteria. Google, Meta, Twitter, and others developed their own proprietary automated bidding platforms. Collectively, these are called real-time bidding (RTB) programmatic advertising platforms. The result today is an extraordinarily complex ecosystem of players and sophisticated technologies (called the ad technology stack).

In programmatic ad platforms, scale has increased dramatically. Today, there are thousands of advertisers and millions of web pages where ads can be placed. The ads are chosen and generated based on the user's browser cookie history and information about the web page so that ads can supposedly target the right consumers. The content of the web page and the ad location on the page are also important. Millions of website pages have content injurious to brands (fake news, hate language, or violence), just very poor content, or even no content. All programmatic advertising platforms use big data repositories that contain personal information on thousands to millions of online shoppers and consumers; analytic software to classify and search the database for shoppers with the desired characteristics; and machine learning techniques to test out combinations of consumer characteristics that optimize the chance of a purchase resulting from exposure to an ad. All of this technology is designed to lower the cost and increase the speed and scale of advertising in an environment in which there are hundreds of millions of web pages to fill with ads and millions of online consumers looking to buy at any given moment.

Programmatic ad platforms have since evolved into three different types: traditional auction-based real-time bidding (RTB) "open exchange," which is a marketplace open to all advertisers and publishers of website pages; private marketplace (PMP), which also uses real-time bidding in which publishers invite selected advertisers to bid on their inventory; and programmatic direct (PD), in which advertisers deal directly with well-established publishers who have developed their own supply-side platforms (an automated inventory of available ad space). Currently, about 75% of programmatic digital display advertising is programmatic direct; about 10.5% is open exchange RTB, and 15% is PMP. The rate of growth of open exchange RTB has slowed significantly. The trend is toward publishers, especially well-known brands with large budgets, to reduce their dependence on the operators of the platforms and exert much more control over where their ads appear, how visible they are, and what content they are associated with. To find out why, continue reading.

Currently, less than 10% of online display advertising in the United States, the United Kingdom, Canada, France, and Germany is still done in a non-automated, traditional environment that involves marketers using e-mail, fax, phone, and text messaging in direct relationships with publishers. Traditional methods are often used for high-value, premium ads, say, at the top of the screen with a video; expanding ads seen at major newspapers, magazines, and portal sites; and native ads appearing alongside or interwoven with native content. This is the world of the traditional insertion order: If you want to advertise on a specific newspaper or magazine website, call the ad department and fill out an insertion order. For instance, if you are a brand selling biking accessories, you can tell your ad agency to place ads in biking magazine websites and on social networks, targeting the readers of those magazines. In this environment, firms who want to sell products and services online hire advertising agencies to develop a marketing plan, and the agency directly contracts with the ad department of the publishers.

This traditional environment is expensive, imprecise, and slow, in part because of the number of people involved in the decision about where to place ads. Also, the technology used is slow, and the process of learning which of several ads is optimal could take weeks or months. Real-time so-called A/B testing is difficult. The ads could be targeted to a more precise group of potential customers, and to a much larger group of

potential customers. Although context advertising on sites dedicated to a niche product is very effective, there are many other websites or social network pages visited by bikers that might be equally effective and cost much less.

The process is very different in a programmatic direct (PD) environment. Ad agencies have access to programmatic ad platforms offered by Google, Yahoo, AOL, Meta, Twitter, and many other pure ad platforms. Working with their clients, the ad agency more precisely defines the target audience to include individuals, ages 24–35, who live in zip codes where mountain biking is a popular activity, have mentioned biking topics on social networks, have e-mails in which mountain biking is discussed, make more than $70,000 a year, and currently do not own a mountain bike. The ad agency enters a bid expressed in dollars per thousand impressions for 200,000 impressions to people who meet most or all of the characteristics being sought. The platform returns a quote for access to this population of 200,000 people who meet the characteristics required. The quote is based on what other advertisers are willing to pay for that demographic and characteristics. The quote is accepted or denied. If accepted, the ads are shown in real time to people as they move about the Web. As people visit various websites, the automated program assesses whether they meet the desired characteristics and displays the mountain bike ad within milliseconds to those people. The programmatic direct platforms also track the responses to the ads in real time and can change to different ads and test for effectiveness based on the platform's experience in near real time. The programmatic direct platforms claim they use algorithms and machine learning programs that can identify over time the most effective ads on the most productive websites. At least this is the promise. Increasingly, large advertisers do not use agencies but deal directly with the ad platforms like Google, Meta, and most recently Amazon (now the third-largest display ad platform).

In private marketplace (PMP) transactions, a group of publishers invite selected advertisers to bid on ad space, often using the publishers' own customer data. Generally, the publishers know more about their customers than the ad platforms' algorithms and databases can provide. For instance, the leading online newspapers might combine their inventory of ad space (web pages) and invite premium big-budget brands to bid on the space. This gives the publishers much more control over who advertises on their pages and gives advertisers a shot at getting premium ad space, better page placement, and better results from more precise knowledge of the consumer. This is reflected in higher costs for the advertisers. In the PMP model, a single publisher directly contracts with selected brands and advertisers for guaranteed placement of ads, and like PMP methods, offers both parties more control and precision. Brands and ad agencies bid for this space in a semi-automated environment. In some cases, prices are negotiated directly between the publisher and the brands or their ad agencies. Real-time bidding is not used.

The risks of RTB in open exchanges are that brands lose a great deal, if not all, of their control over the presentation of ads, including what websites they appear on, where on the screen they appear (above or below the "fold" or scroll), how long the ad is present on screen, who is doing the clicking on the ads (real interested persons or bots or fake people), and the content of the website.

For instance, JPMorgan Chase at one point had ads appearing on an estimated 400,000 websites a month using programmatic RTB open exchange auctions. The company became suspicious when only 12,000 sites produced any clicks. An intern was

assigned to visit each site to see whether it was appropriate for the bank. The intern discovered that 7,000 were not, leaving only 5,000 acceptable as pre-approved websites. JPMorgan Chase has not experienced any fall-off in the visibility of its ads on the Internet since it eliminated 355,000 websites from its ad campaign. JPMorgan Chase has since winnowed the list to only 1,000 approved sites. One of the non-approved sites advertising the JPMorgan Chase's private client services turned out to be a website that advocated violence.

In the past, YouTube came under intense fire from leading brands because their YouTube ads were appearing next to offensive material that promoted racism, hate, and terrorism. As a result, JPMorgan Chase, Verizon, Gerber, AT&T, Johnson & Johnson, Lyft, and Procter & Gamble (the world's largest advertiser) all pulled ads from YouTube. In response, YouTube hired thousands of employees to monitor websites and teach machine learning algorithms what is an acceptable website for ads. However, despite YouTube's efforts, the problem has continued. For instance, in 2022, major advertisers such as Disney, Vodafone, and others pulled advertising from YouTube after their ads were shown in connection with offensive content.

In addition to malicious sites, there are millions of fake sites on the Web that are set up for the sole purpose of displaying ads and generating revenue. Many of the fake sites are bots that generate clicks but have no real people viewing the ads. Although RTB open exchange platforms try to prevent this behavior, they can easily be defeated. The result is large ad expenditures but fewer legitimate clicks and fewer conversions. Analysts estimate that the top 50 online media publishers account for only 5% of all ads shown on the Web. This means that 95% of the ads are being shown on niche websites with small audiences or on completely fake sites with fake visitors. In general, ad platforms have little idea, if any, of where the ads are appearing, the content of the websites, or who is clicking. Top brands with large budgets no longer believe the ad platforms' claims that they use algorithms and machine learning to weed out fake sites, hate sites, and sites that feature porn. As a result, many large companies now employ brand safety firms to track their ad campaigns and prevent the firm's ads from appearing on certain sites.

SOURCES: "Fundamentals of Programmatic Advertising," by Evelyn Mitchell, Insider Intelligence/eMarketer, July 27, 2022; "Programmatic Advertising Explainer," by Evelyn Mitchell, Insider Intelligence/eMarketer, July 19, 2022; "Big Brands Pull Ads as YouTube Battles Conspiracy and Misinformation," by Chris Sutcliffe, Thedrum.com, February 14, 2022; "YouTube Confronts New Brand Safety Issues," by Lucia Moses, Businessinsider.com, March 24, 2021; "To Show How Easy It Is for Plagiarized News Sites to Get Ad Revenue, I Made My Own," by Megan Graham, Cnbc.com, May 17, 2020; "YouTube Hiring More Humans to Train Computers to Police the Site," by Daisuke Wakabayashi, *New York Times*, December 4, 2017; "Chase Had Ads on 400,000 Sites. Then on Just 5,000. Same Results," by Sapna Maheswari, *New York Times*, March 29, 2017; "Consumer Attitude Towards Website Advertising Formats: A Comparative Study of Banner, Pop-up and In-Line Display Advertisements," by Tri de Le, *Journal of Internet Marketing and Advertising*, January 13, 2017.

Case Study Questions

1. Pay a visit to your favorite portal, and count the total ads on the opening page. Count how many of these ads are (a) immediately of interest and relevant to you, (b) sort of interesting or relevant but not now, and (c) not interesting or relevant. Do this 10 times and calculate the percentage of the three kinds of situations. Describe what you find, and explain the results using this case.
2. Advertisers use different kinds of "profiles" in the decision to display ads to customers. Identify the different kinds of profiles described in this case, and explain why they are relevant to online display advertising.
3. How can display ads achieve search-engine–like results?
4. Do you think instant display ads based on your immediately prior clickstream will be as effective as search engine marketing techniques? Why or why not?

6.7 REVIEW

KEY CONCEPTS

■ Understand the key features of the online audience, the basic concepts of consumer behavior and purchasing, and how consumers behave online.

- Key features of the online audience include the number of users online, the intensity and scope of use, demographics and aspects, the type of Internet connection, and community effects.
- Models of consumer behavior attempt to predict or explain what consumers purchase and where, when, how much, and why they buy. Factors that impact buying behavior include cultural, social, and psychological factors.
- There are five stages in the consumer decision process: awareness of need, search for more information, evaluation of alternatives, the actual purchase decision, and post-purchase contact with the firm.
- The online consumer decision process is basically the same, with the addition of two new factors: website and mobile platform capabilities and consumer clickstream behavior.

■ Identify and describe the basic digital commerce marketing and advertising strategies and tools.

- *A website* is the major tool for establishing the initial relationship with the customer.
- *Search engine marketing and advertising* involve the use of search engines to build and sustain brand as well as to support direct sales of products and services.
- *Display ads* include banner ads, rich media, video ads, sponsorships, native advertising, and content marketing. Today, almost all display advertising is served by advertising networks that use programmatic advertising and real-time bidding.
- *E-mail marketing* sends e-mail directly to interested users and has proven to be one of the most effective forms of marketing communications.
- *Lead generation marketing* uses multiple e-commerce presences to generate leads for businesses who later can be contacted and converted into customers.
- *Affiliate marketing* is a form of marketing in which a firm pays a commission when visitors to a different website, blog, or social media page click the firm's link on that website or page and visit the firm's website and/or make a purchase there.
- *Social marketing and advertising* involve using the social media to communicate brand images as well as to directly promote sales of products and services.
- *Mobile and local marketing and advertising* involve using display ads, search engine advertising, video ads, and mobile messaging on mobile devices such as smartphones and tablet computers, often using the geographic location of the user.
- *Multi-channel marketing (combining offline and online marketing efforts)* is typically the most effective type of marketing. Although many e-commerce ventures want to rely heavily on online communications, marketing communications campaigns that are the most successful at driving traffic incorporate both online and offline tactics.
- *Customer retention techniques* for strengthening customer relationships include personalization, one-to-one marketing, and interest-based advertising, customization and customer co-production, and customer service (such as FAQs, live chat, intelligent agents, and automated response systems).
- *Online pricing strategies* include offering products and services for free, versioning, bundling, and dynamic pricing.

Identify and describe the main technologies that support online marketing.

- Web transaction logs—records that document user activity at a website. Coupled with data from the registration forms and shopping cart database, these represent a treasure trove of marketing information for both individual sites and the online industry as a whole.
- Tracking files—various files, like cookies, web beacons, Flash cookies, and apps, that follow users and track their behavior as they visit sites across the Web.
- Databases, data warehouses, data marts, data lakes, data mining, and profiling—technologies that allow marketers to identify exactly who the online customer is and what they want and then to present the customer with exactly what they want, when they want it, and for the right price.
- CRM systems—a repository of customer information that records all of the contacts a customer has with a firm and generates a customer profile that is available to everyone in the firm who has a need to "know the customer."

Understand the costs and benefits of online marketing communications.

- Key terms that one must know in order to understand evaluations of online marketing communications' effectiveness and its costs and benefits include:
  - Impressions, click-through rate, view-through rate, hits, page views, viewability rate, unique visitors, loyalty, reach, recency, stickiness (duration), acquisition rate, conversion rate, browse-to-buy ratio, view-to-cart ratio, cart conversion rate, checkout conversion rate, abandonment rate, retention rate, attrition rate, view time, completion rate, skip rate, open rate, delivery rate, click-through rate (e-mail), and bounce-back rate.
- Studies have shown that low click-through rates are not indicative of a lack of commercial impact of online advertising and that advertising communication does occur even when users do not directly respond by clicking. Online advertising in its various forms has been shown to boost brand awareness and brand recall, to create positive brand perceptions, and to increase intent to purchase. Online sales can generally be directly correlated with online marketing efforts, unlike traditional marketing communications tactics.
- Effectiveness cannot be considered without analysis of cost. Typical pricing models for online marketing communications include barter, cost per thousand (CPM), cost per click (CPC), cost per action (CPA), hybrid models, and sponsorships. Effective cost-per-thousand (eCPM) measures return on investment by dividing the total earnings from an ad by the total number of impressions in thousands.
- Marketing analytics help e-commerce firms to better understand consumer behavior at each stage of the online purchasing process.

QUESTIONS

1. Is growth of the Internet, in terms of U.S. users, expected to continue indefinitely? What, if anything, will cause it to slow?
2. How does the model of online consumer behavior differ from the traditional model of consumer behavior?
3. What marketing functions do websites serve?
4. Research has shown that consumers often use the Internet to investigate purchases before buying at a physical location. What implication does this have for online merchants?
5. What are some of the issues with search engine advertising?
6. Why have advertising networks become controversial? What, if anything, can be done to overcome any resistance to this technique?
7. What is a marketing automation system, and how is it used?
8. List the differences among databases, data warehouses, data marts, data lakes, and data mining.
9. What is big data, and why are marketers interested in it?

10. What pricing strategy turned out to be deadly for many e-commerce ventures during the early days of e-commerce? Why?
11. Is price discrimination different from versioning? If so, how?
12. What are some of the reasons that freebies, such as free Internet service and giveaways, don't work to generate sales at a website?
13. Explain how versioning works. How is it different from dynamic pricing?
14. Why do companies that bundle products and services have an advantage over those that don't or can't offer this option?
15. What are some reasons online advertising now constitutes more than 70% of the total advertising market?
16. What are some of the advantages of direct e-mail marketing?
17. Why is offline advertising still important?
18. What is the difference between hits and page views? Why are these not the best measurements of web traffic? Which is the preferred metric for traffic counts?
19. Define CTR, CPM, CPC, CPA, and VTR.
20. What are marketing analytics, and how are they used?

PROJECTS

1. Go to www.strategicbusinessinsights.com/vals/surveynew.shtml. Take the survey to determine which lifestyle category you fit into. Then write a two-page paper describing how your lifestyle and values impact your use of e-commerce. How is your online consumer behavior affected by your lifestyle?
2. Choose an e-commerce site for a small or medium-sized business that you are familiar with, and create an online marketing plan for it that includes each of the following: one-to-one marketing, affiliate marketing, mobile marketing, and social network marketing. Describe how each plays a role in growing the business, and create a slide presentation of your marketing plan.
3. Use the Online Consumer Purchasing Model (Figure 6.10) to assess the effectiveness of an e-mail campaign at a small website devoted to the sales of apparel to the ages 18–26 young adult market in the United States. Assume a marketing campaign of 100,000 e-mails (at 25 cents per e-mail address). The expected click-through rate is 5%, the customer conversion rate is 10%, and the loyal customer retention rate is 25%. The average sale is $60, and the profit margin is 50% (the cost of the goods is $30). Does the campaign produce a profit? What would you advise doing to increase the number of purchases and loyal customers? What web design factors? What communications messages?
4. Surf the Web for at least 15 minutes. Visit at least two different e-commerce sites. Make a list describing in detail all the different marketing communication tools you see being used. Which do you believe is the most effective and why?
5. Do a search for a product of your choice on two search engines. Examine the results page carefully. Can you discern which results, if any, are a result of a paid placement? If so, how did you determine this? What other marketing communications related to your search appear on the page?
6. Examine the use of rich media and video in advertising. Find and describe at least two examples of advertising using streaming video, sound, or other rich media technologies. (Hint: Check the sites of online advertising agencies for case studies or examples of their work.) What are the advantages and/or disadvantages of this kind of advertising? Prepare a three- to five-page report on your findings.
7. Visit Facebook, and examine the ads shown in the right margin and in your Feed. What is being advertised and how do you believe it is relevant to your interests or online behavior? You could also search on a retail product, and on related products, on Google several times, and then visit Yahoo or another popular site to see whether your past behavior is helping advertisers track you.

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CHAPTER 7

Social, Mobile, and Local Marketing

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

7.1 Understand the difference between traditional online marketing and social-mobile-local marketing platforms and the relationships among social, mobile, and local marketing.

7.2 Understand the social marketing process from fan acquisition to sales and the marketing capabilities of social marketing platforms such as Facebook, Instagram, TikTok, Twitter, and Pinterest.

7.3 Identify the key elements of a mobile marketing campaign.

7.4 Understand the capabilities of location-based local marketing.

NEW Video Cases

See **eText Chapter 7** to watch these videos and complete activities:

7.1 Snap and Augmented Reality Marketing

7.2 AppLovin's Mobile Marketing Platform

#Marketing:

#BookTok, #WeddingTok, and #CrumblReviews

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Social networks such as TikTok offer myriad opportunities for companies to engage consumers, amplify product messages, discover trends and influencers, build brand awareness, respond to customer requests and recommendations, and, increasingly, sell their products directly to consumers. Social listening helps companies and marketers understand more about buyers' likes, dislikes, and complaints concerning products or product modifications that customers want and how people are talking about a brand (positive or negative sentiment).

TikTok is a short-form video sharing app owned by Chinese company Bytedance. TikTok is one of the fastest-growing social networks, with 95 million U.S. users (third, behind Facebook and Instagram but the most popular among children, teens, and young adults, with more than 45% of its U.S. users younger than the age of 25).

A hashtag is a word, number, phrase, and/or emoji following the # symbol that can be used to categorize and track comments on social media. Hashtags can be added to social posts, comments, and bios on most social network platforms and have become an integral part of social marketing and social listening, particularly on TikTok. Although hashtags were originally aimed at organizing content, they are now also being used to amplify marketing messages. Hashtags can help social marketers reach niche audiences and build community.

For instance, reading books is not something that is typically associated with members of the Gen Z and Millennial generations. However, the #BookTok community on TikTok, comprised mostly of women in their teens and 20s, has more than 75 billion views as of September 2022. #BookTok members often record time lapses of themselves reading or their emotional reactions to something they have just read. #BookTok has had a significant impact on the book industry, with some books featured in videos seeing a resurgence in sales even though the books may have been published years previously. For instance, *The Song of Achilles*, by Marilyn Miller, was first published in 2012. After being featured in a TikTok video called "books that will make you sob" in August 2021, its sales grew to nine times greater than they were when the book was first released. The creator of the "books that make you sob" video, Selene Velez, known as @moongirlreads on TikTok, now has more than 220,000 followers and has started making videos that publishers pay her to create.

Initially, the vast majority of #BookTok videos happened organically, but as the book publishing industry has become more aware of the trend, they have jumped on board as well. For instance, Barnes & Noble now has #BookTok tables in their stores. Book of the Month began working with #BookTok influencers in late 2020 and in 2021 created a formal #BookTok influencer program. At first, Book of the Month gave its influencers specific guidelines, but it soon discovered that this limited influencers' creativity. After Book of the Month gave creators more freedom, the creators' videos generated many more views. According to Samantha Boures, Book of the Month's manager of media and influencer marketing, the impact of its #BookTok influencers on book sales and subscriptions has been very positive. According to BookScan, #BookTok helped authors sell 20 million printed books in 2021.

With more than 2.9 billion views, #WeddingTok is another TikTok community that is having a transformative impact on marketing. In many cases, rather than consulting traditional sources such as magazines, bridal expositions, websites, or blogs, the Gen Z generation is turning to TikTok for wedding inspiration. This fact has not gone unnoticed by some of the leading names in the wedding industry. For example, David's Bridal, one of the leading wedding dress retailers in the United States, teamed up with digital advertising platform KERV Interactive and digital agency partner January Digital to create shoppable content on TikTok that allows users to view and shop products directly from the TikTok app. The campaign had a clickthrough rate that was twice the average benchmark and racked up more 16 million views in less than two months.

Using social networks such as TikTok for brand marketing is not without its drawbacks, however. Crumbl Cookies' experience is instructive. Crumbl Cookies has ridden a TikTok wave to become one of the trendiest bake shop chains in the country. Founded in 2017 by two former Utah State students, Crumbl entered a crowded gourmet cookie market, but its claim to fame is its limited-edition cookies. Every week, four different cookie flavors are showcased. The brand really took off on TikTok when a post about the brand's showcased Strawberry Toast Tart cookie went viral and got 2 million views. From there, the company gained 1.6 million TikTok followers in just six weeks. TikTokers jumped on the bandwagon and started posting cookie reviews using the hashtag #crumblreview. Although Crumbl does not sponsor or compensate creators, the company rewards their most loyal TikTok creators by displaying their reviews in Crumbl stores. Currently, Crumbl's #crumblcookies account has 5.8 million followers and 59.4 million likes. But Crumbl has recently been experiencing some social media backlash One TikToker took a video of a delivery of several boxes of Chips Ahoy cookies being dropped off at a Crumbl store and posted the video with an overlay saying that Crumbl had some "explaining to do." The video got more than 6.7 million views. Another TikToker posted video of boxes of Betty Crocker mixes in the store. That video quickly garnered more than 5 million views, with commentors expressing their disappointment as well as their concerns about the chain's prices. Its possible that Crumb's TikTok following may turn against it.

Keeping a brand's positive reputation is another major concern. For instance, viral "TikTok Challenge" videos are one of TikTok's hallmarks. Some of the challenges have led to serious injury or death. Even if a brand has not sponsored the specific challenge, merely being associated with the challenge can be a problem. The "Sleepy

SOURCES: "Does Crumbl Cookes Use Betty Crocker Cake Mix? Viral TikTok Sparks Rumors," by Virgina Glaze, Dexerto.com, September 8, 2022: "Is TikTok Becoming a Bridal Shopping Portal," by Tom Ryan, Retailwire.com, August 5, 2022: "David's Bridal Partners with KERV Interactive, TikTok, and January Digital to Deliver Optimized Shoppable Product Content on TikTok," Prnewswire.com, July 26, 2022; "What Is Hashtagging and How to Use It Effectively," by Aubree Smith, Sproutsocial.com, July 19, 2022; "Trend Alert: WeddingTok," by Jessica Pinkett, Voxburner.com, July 15, 2022; "How TikTok Became a Best Seller Machine," by Elizabeth Harris, *New York Times*, July 6, 2022; "It's Almost Preposterous to Get Married These Days without Consulting #WeddingTok First, Ypulse.com, July 1, 2022: "TikTok Commerce 2020," by Jasmine Enberg, Insider Intelligence/eMarketer, March 30, 2022; "How BookTok Changed Book of the Month's Influencer Marketing Strategy," by Phoebe Bain, Marketingbrew.com, March 7, 2022; "Why TikTok Thinks This Video 'Exposes' Crumbl Cookies," by Katherine McLaughlin, Mashed.com, March 1, 2022: "TikTok for Business, What's Next: Building for Brand Safety," Tiktok.com, February 24, 2022; "TikTok Launches New Brand Safety Center

Chicken/NyQuil Chicken" challenge is one such example. The challenge involves cooking chicken in a sedative cough syrup such as NyQuil, a very dangerous endeavor. The manufacturer of NyQuil was forced to issue a statement advising consumers not to use its product in this manner. TikTok has also been plagued with concerns about its content moderation policies and recently agreed to pay $92 million to settle a federal class action suit based on its failure to protect its users' biometric and personal data. In addition, TikTok has been fined by various regulatory agencies for lax data protections for its underage users.

TikTok has attempted to address concerns about brand safety by establishing a Brand Safety Center. It now offers a variety of solutions to help ensure that branded content on the platform is displayed adjacent to suitable videos. It also has introduced an array of initiatives, such as age-related privacy and safety settings and tools to promote kindness, to combat bullying, and to curb the spread of misinformation, that are aimed at keeping the TikTok community safe. Whether these solutions and tools will truly be effective remains to be seen. However, many brands, lured by the opportunity to gain exposure to the lucrative Gen Z and Millennial demographics that TikTok provides, appear willing to take the risk.

to Provide a Central Hub for Its Various Resources," by Andrew Hutchinson, Socialmediatoday.com, February 15, 2022; "TikTok 'Sleepy Chicken' Challenge Warning! Experts Warn Consumers to Avoid 'Nyquil Chicken' Trend," by Griffin Davis, Techtimes.com, January 15, 2022; "Booktokers Are Completely Changing Publishing," Mic.com, November 25, 2021; "Crumbl Really Blew up on TikTok This Year," by Jacqueline Mumford, Utahbusiness.com, October 25, 2021; "Federal Court Gives Preliminary Approval of $92 Million TikTok MDL Settlement Over Objections," *National Law Review*, October 5, 2021; "How Crumbl Cookies Took Over TikTok," by Maile Mccain, Modernretail.com, June 21, 2021; "How Crying on TikTok Sells Books," by Elizabeth Harris, *New York Times*, March 20, 2021.

The opening case illustrates how companies are using social networks such as TikTok to engage with and market to consumers. Because most users interact with social networks via a mobile device, social marketing is also inextricably connected to mobile marketing. Local marketing is also connected to mobile marketing, as mobile devices provide a means for marketers to more accurately target users' locations.

In this chapter, we will take an in-depth look at the many facets of social, mobile, and local marketing. We'll first provide an overview of all three types and discuss how they are connected. Then we'll look at social marketing, first examining the social marketing process and how to measure social marketing results and then focusing on each of the major platforms and their various features and marketing tools. We conclude the section on social marketing with a consideration of some of the issues that surround it. Next, we'll examine mobile marketing, once again providing an overview and then looking at mobile marketing features and tools. We'll finish with a section on local marketing, with particular emphasis on location-based (local) mobile marketing.

7.1 INTRODUCTION TO SOCIAL, MOBILE, AND LOCAL MARKETING

Social, mobile, and local marketing have transformed the online marketing landscape. Before 2007, Facebook was a fledgling company limited to college students. Apple had not yet announced the iPhone. Online marketing consisted largely of creating a corporate website, buying display ads on Yahoo, purchasing AdWords on Google, and sending e-mail. The workhorse of online marketing was the display ad that flashed brand messages to millions of users who were not expected to respond immediately, ask questions, or make observations. The primary measure of success was how many "eyeballs" (unique visitors) a website attracted and how many "impressions" a marketing campaign generated. An impression was one ad shown to one person. Both of these measures were carryovers from the world of television, which measures marketing in terms of audience size and ad views.

FROM EYEBALLS TO CONVERSATIONS

After 2007, everything began to change, with the rapid growth of Facebook and other online social networks; the explosive growth of smartphones, beginning with the Apple iPhone in 2007; and the growing interest in local marketing. What's different about the world of social-mobile-local marketing and advertising are the related concepts of "conversations" and "engagement." Marketing today is based on businesses marketing themselves as partners in multiple online conversations with their customers, their potential customers, and even their critics. Your brand is being talked about on the Web and on social networks (that's the conversation part). Today, marketing your firm and brands requires you to locate, identify, and participate in these conversations. Social marketing means all things social: listening, discussing, interacting, empathizing, and engaging. Rather than bombarding your audience with fancy, loud ads, instead have a conversation

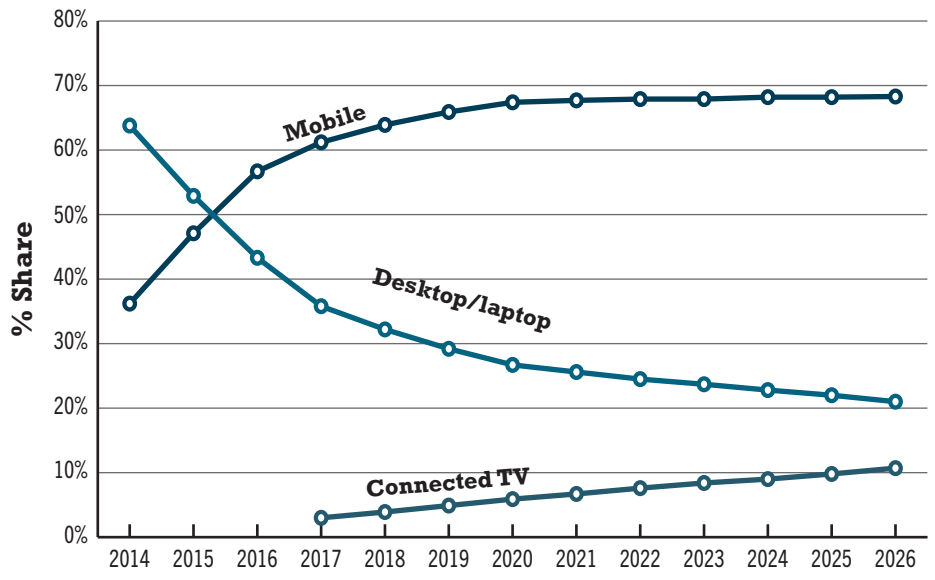
with them and engage them in your brand. The emphasis in online marketing has shifted from a focus on eyeballs to a focus on participating in customer-oriented conversations. In this sense, social marketing and advertising is not simply another "ad channel" but, rather, a collection of technology-based tools for communicating with shoppers.

In the past, businesses could tightly control their brand messaging and lead consumers down a funnel of cues that ended in a purchase. That is not true of social marketing. Consumer purchase decisions are increasingly driven by the conversations, choices, tastes, and opinions of a consumer's social network. Social marketing is all about businesses participating in and shaping this social process.

FROM THE DESKTOP TO THE SMARTPHONE AND TABLET

In 2016, for the first time, spending on mobile marketing exceeded spending on desktop/laptop marketing. **Figure 7.1** illustrates the rapidly changing trajectory of ad spending between 2014 and 2026. In 2014, marketers spent about 64% of their online ad spending on desktop marketing and only 36% on mobile marketing. By 2018, that percentage had almost totally flipped, with 64% of ad spending devoted to mobile marketing and only 32% to desktop/laptop marketing. The marketing dollars are following customers and shoppers from the desktop computer to mobile devices and, more recently, to connected TVs. In 2022, spending on mobile advertising is expected to reach almost $170 billion and by 2026, is expected to reach nearly $250 billion. Spending on social network advertising has also been growing at a rapid rate, paralleling that of mobile

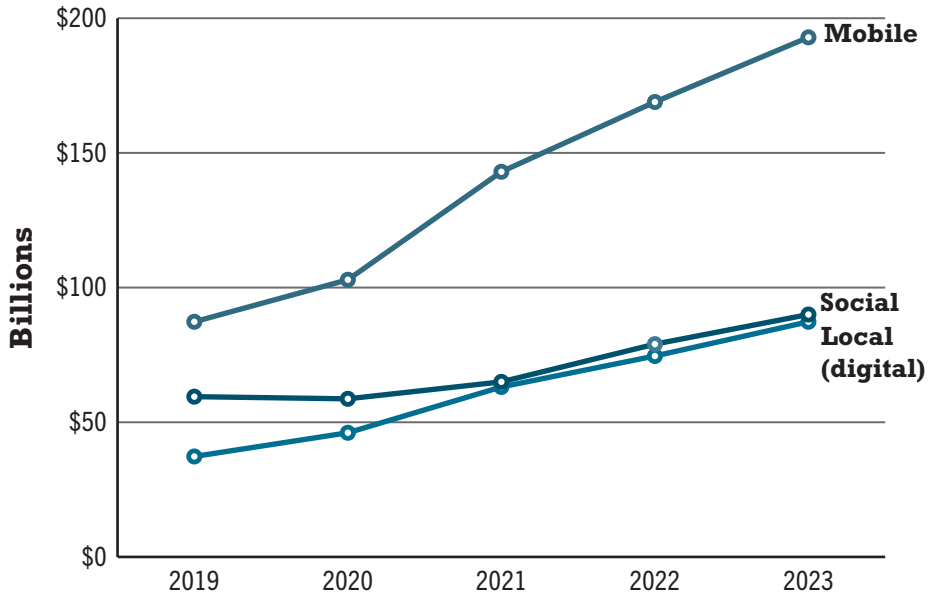
FIGURE 7.1 **THE RAPIDLY CHANGING TRAJECTORY OF ONLINE AD SPENDING**



By 2026, mobile marketing is expected to account for almost 70% of all digital ad spending.

SOURCE: Based on data from Insider Intelligence/eMarketer, 2022a.

FIGURE 7.2 SOCIAL, MOBILE, AND LOCAL MARKETING 2019–2023



Both mobile and social advertising spending are expected to more than double from 2019 to 2023.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022a, 2022b; BIA Advisory Services, 2019, 2020, 2021, 2022; authors' estimates.

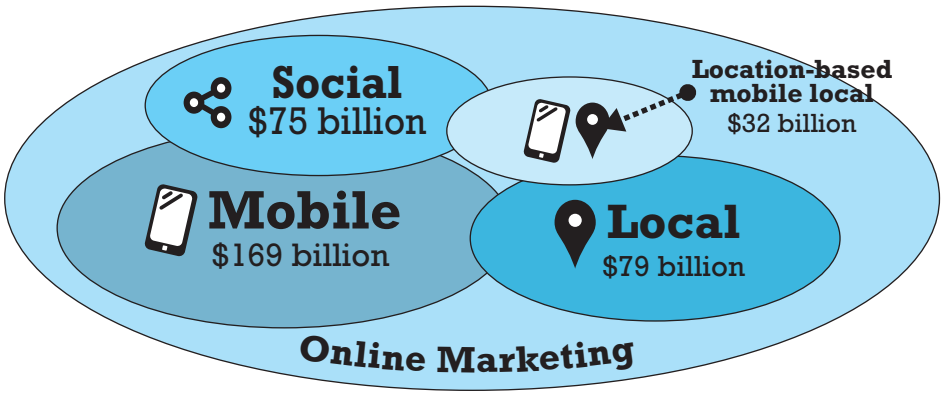
advertising in its early years, when it was growing by more than 30% a year. In 2022 social network ad spending is expected to reach about $75 billion. Although its growth rate has not been as astronomical as that of mobile or social advertising, local online advertising has also been growing in importance. In 2022, advertisers are expected to spend about $79 billion on local online advertising (see **Figure 7.2**).

THE SOCIAL, MOBILE, LOCAL NEXUS

Social, mobile, and local digital marketing are self-reinforcing and connected. Most social marketing occurs on the mobile platform because that is the method that most users use to access most social networks. For instance, in 2022, 93% of Twitter's U.S. users access Twitter from a mobile device, with 55% using only a mobile device. Mobile advertising generates the vast majority (more than 95%) of Twitter's ad revenues. Likewise, about 95% of Facebook's U.S. users access Facebook via a mobile device, and more than two-thirds use only a mobile device. More than 97% of the U.S. ad revenues of Meta (parent company of both Facebook and Instagram) are generated by its mobile audience.

Local marketing and mobile are highly related: Local advertisers most often target mobile devices. And a considerable amount of mobile ad spending comes from local advertisers. As mobile devices become more widely adopted, they can be used by customers to find local merchants and by merchants to alert customers to special offers in their neighborhood. The strong ties among social, mobile, and local marketing have

FIGURE 7.3 ONLINE MARKETING PLATFORMS



Mobile, social, and local marketing are increasingly interconnected. Mobile marketing includes both social network marketing and local marketing. Most social network marketing takes place on the mobile platform. Social marketing can also be local. Local online marketing may be both mobile and social. Mobile local advertising comprises about 20% of total mobile advertising and about 41% of total local online marketing.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022a, 2022b; BIA Advisory Services, 2022; authors' estimates.

significant implications for managing your own marketing campaign. The message is that when you design a social marketing campaign, you must consider that your customers will be accessing the campaign using mobile devices and will often also be looking for local content. Social-mobile-local must be seen in an integrated marketing framework. **Figure 7.3** puts social-mobile-local forms of advertising in context. Over time, social-mobile-local advertising will become even more overlapped as the three platforms become more tightly coupled.

In the sections that follow we will examine social, mobile, and local marketing more closely. The focus will be on describing the primary marketing tools of each platform and on examining how to envision and manage a marketing campaign on each platform.

7.2 SOCIAL MARKETING

Social marketing differs markedly from traditional online marketing. The objectives of traditional online marketing are to put your business's message in front of as many visitors as possible and, you hope, to encourage them to come to your website to buy products and services or to find out more information. The more "impressions" (ad views) and the more unique visitors you get, the better. Traditional online marketing never expected to listen to customers, much less to have a conversation with them, any more than TV advertisers expected to hear from viewers.

In social marketing, the objective is to encourage your potential customers to become fans of your company's products and services and to engage with your business

by entering into a conversation with it. Your further objective is to encourage your business's fans to share their enthusiasm with their friends and, in so doing, to create a community of fans online. Ultimately, the point is to strengthen the brand and drive sales—and to do this by increasing your "share of the online conversation."

SOCIAL MARKETING PLAYERS

There are hundreds of social networks in the United States and worldwide, but the most popular (Facebook, Instagram, TikTok, Twitter, Pinterest, Snapchat, and LinkedIn) account for more than 90% of all visits. (See Chapter 11 for a full discussion of social networks.)

Although the number of monthly, unique visitors is a good measure of market reach, it is not helpful in understanding engagement: the amount and intensity of user involvement. One measure of engagement is the amount of time users spend on a social network. Overall, users of social networks spend about 1 hour and 40 minutes a day on all social networks combined. TikTok attracts the most engagement of all the networks, with U.S. adults averaging about 45 minutes a day and more than 22 hours a month on the platform (Insider Intelligence/eMarketer, 2022c).

For a manager of a social marketing campaign, these findings suggest that in terms of reach and engagement, the place to start a social campaign is TikTok. Yet visitors to the other leading social networks collectively account for a significant amount of the social market space, and, therefore, a social marketing campaign also has to include them at some point. It helps that social network users use multiple social networks. TikTok users are likely to be users of Instagram and Snapchat and perhaps Facebook, Twitter, and Pinterest. In addition, marketers need to be aware of what has come to be known as dark social. **Dark social** refers to those forms of social sharing that occur off the major social networks and via alternative communication tools such as interpersonal conversations, group meetings, and friendships, not to mention e-mails, instant messages, texts, and mobile messaging apps. Although U.S. adults overall are expected to average about 60 hours a month on all networks combined in 2022, there are 720 total hours in a month. Therefore, only about 8% of all social life in a month involves online social networks, whereas 92% does not (Insider Intelligence/eMarketer, 2022c).

dark social
those forms of social sharing that occur off the major social networks and via alternative communication tools such as e-mails, instant messages, texts, and mobile messaging apps

THE SOCIAL MARKETING PROCESS

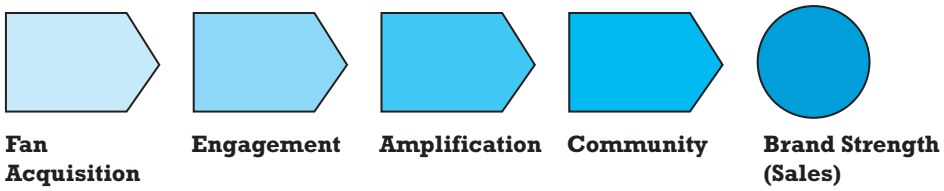
At first glance, the large number of different social networks is confusing, each with a unique user experience to offer. Yet they can all be approached with a common framework. **Figure 7.4** illustrates a framework that can be applied to all social marketing efforts. View the Figure 7.4 video in the eText for an animated and more detailed discussion of this figure.

There are five basic steps in the social marketing process: fan acquisition, engagement, amplification, community, and brand strength (sales). Each of these steps in the process can be measured. Both the objectives and the metrics of social marketing are quite different from those of traditional web marketing or television marketing, and this is what makes social marketing so different.

fan acquisition
attracting people to your marketing messages

Social marketing campaigns begin with **fan acquisition**, which involves using any of a variety of means to attract people to your Facebook page, Instagram account,

FIGURE 7.4 THE SOCIAL MARKETING PROCESS



The social marketing process has five steps.

Twitter feed, Pinterest boards, or other platform. It's getting your brand "out there" in the stream of social messages. Display ads on social networks have a social dimension (sometimes called "display ads with social features" or, simply, "social ads"). Social ads encourage visitors to interact and do something social, such as participate in a contest, obtain a coupon, or obtain free services for attracting friends.

The next step is to generate **engagement**, which involves using a variety of tools to encourage users to interact with your content and brand. You can think of this step as "starting the conversation" around your brand. You want your fans to talk about your content and products. You can generate engagement by posting attractive photos and interesting text content, with plenty of opportunities for users to express their opinions. Companies often turn to **influencers**, people who have dedicated followers on social media and who are viewed by those followers as trusted experts or celebrities, to generate additional engagement. Today, **influencer marketing** has become a subset of social media marketing in which brands seek to leverage the trust that influencers have built up with their following to generate brand awareness and engagement and, ultimately, to translate recommendations and product mentions from influencers into sales. In 2022, companies are expected to spend $5 billion on influencer marketing, and that amount is expected to increase to more than $7 billion by 2024. More than 90% of B2C marketers engage influencers to build awareness and credibility for their brands. Instagram is by far and away the leading platform for influencer marketing spending, accounting for almost 45% of such spending. However, spending on TikTok influencers is increasing rapidly, with marketers spending nearly twice as much on TikTok influencers as they did in 2021 (Insider Intelligence/eMarketer, 2022d).

After you have engaged your visitors, you can begin to use social network features to amplify your messages by encouraging users to tell their friends by clicking a Like button, sharing a post, or sending a message to their followers on Twitter. **Amplification** involves using the inherent strength of social networks. On Facebook, the average user has 120 "friends." This group includes all the people they have ever friended, including people whom they don't really know (and who don't really know them). Most people typically have only three to four really close friends with whom they can discuss confidential matters and a larger set of around 20 friends (mutual friends) with whom they have two-way communications. Let's use 20 as a reasonable number of mutual friends for marketing purposes. For marketers, this means that if they can attract one follower or fan and encourage that person to share their approval with their friends, the message

engagement
encouraging visitors to interact with your content and brand

influencers
people who have dedicated followers on social media and who are viewed by those followers as trusted experts or celebrities

influencer marketing
a subset of social media marketing in which brands seek to leverage the trust that influencers have built up with their following to generate brand awareness and engagement and, ultimately, to translate recommendations and product mentions from influencers into sales

amplification
encouraging visitors to share their Likes and comments with their friends

can be amplified 20 times: 20 friends of the one fan can be influenced. Best of all: The friends of fans are free. Marketers pay to attract only the initial fan, and they are not (currently) charged by social networks for the amplification that can result.

community
a stable group of fans who are engaged and communicating with one another about your brand

After you have gathered enough engaged fans, you will have created the foundation of a **community**—a more or less stable group of fans who are engaged and communicating with one another over a substantial period of time (say, several months or longer). Marketers have a number of tactics—including insider information on new products, price breaks for loyalty, and free gifts for bringing in new members—to nurture these communities. The ultimate goal is to enlarge your firm's "share of the online conversation." The process ends with strengthening the brand and, hopefully, garnering additional sales of products and services. Brand strength can be measured in a variety of ways both online and offline, a subject that is beyond the boundaries of this text (Ailawadi et al., 2003; Aaker, 1996; Simon and Sullivan, 1993; Keller, 1993).

Ultimately, the point of marketing is to drive sales revenue. Measuring the impact of a social marketing campaign on brand strength and sales is still being explored by marketers, social network managers, and researchers, but generally the results are positive: Social marketing campaigns drive sales. Most of the top social networks, including Facebook, Instagram, TikTok, and Pinterest, have added social commerce features, such as Buy buttons and other shopping functionality, that make it even easier for the targets of those social marketing campaigns to act on them and make a purchase.

MEASURING SOCIAL MARKETING RESULTS

Table 7.1 describes some of the basic metrics to use when evaluating a social marketing campaign and presents the five steps of the social marketing process just discussed and illustrated in Figure 7.4: fan acquisition, engagement, amplification, community, and, ultimately, brand strengthening and sales—as an organizing schema.

Although the ultimate goal of social marketing is to drive sales (which typically will take place on your website), it is very important to understand what the elements of social marketing that produce these sales are and how these elements can be improved.

At the most elementary level, the number of fans (or followers) generated on the platform is the beginning of all social marketing. Visitors become fans when they like your content. In the early days of social marketing, firms put a great deal of emphasis on the size of the fan base and on collecting Likes. However, there is less emphasis on those metrics today because social marketing managers have become more sophisticated. Fan engagement in your content and brand is the first step toward developing a truly social experience and, arguably, is more important than simply the number of impressions or the number of fans. Fans that you never hear from are not valuable. Engagement relates to how your fans are interacting with your content, how intensely, and how often. Understanding the kinds of content (videos, text, photos, or posts from fans) that create the highest levels of engagement is also very important.

The ability to amplify your marketing message by tapping into the social networks used by your fans is also at the core of social marketing. Amplification (also sometimes referred to as reach) can be quantified by examining the rate at which fans recommend your content to their friends and how many of their friends further recommend your content to their friends.

TABLE 7.1 MEASURING SOCIAL MARKETING RESULTS

SOCIAL MARKETING PROCESS	MEASUREMENT
Fan Acquisition (impressions)	The number of fans/followers and monthly growth. The number of people exposed to posts and other content. The percentage of those exposed who become fans/followers. The ratio of impressions to fans/followers.
Engagement (conversation rate)	The number of users who responded to brand content. The number of posts, comments, and responses to brand content. The number of views of brand content. The number of "Likes" generated per visitor. The number of minutes on average that visitors stay on your brand or product page (duration). The rate of Likes per post or other content (applause rate).
Amplification (reach)	The percentage of Likes, shares, or posts to other sites (the rate at which fans share content).
Community	The monthly interaction rate with your content. The average monthly on-site minutes for all fans/followers. The ratio of positive to negative comments.
Brand Strength/Sales	The number of leads generated (people who sign up for news or content). Visitor/lead rate: the number of visitors that become leads compared to the number resulting from other campaigns. The percentage (or revenue) of your online sales that is generated by social network links compared to the percentage generated by other platforms, such as e-mails, search engines, and display ads. The percentage of social network–sourced customer purchases compared to other sources of customers (conversion ratio). The conversion ratio for friends of fans/followers.

Measuring the strength of a social network community is not that much different from measuring the strength of an offline community. In both cases, you attempt to measure the collective activities of everyone in the community. Among your fans, how many actively participate in the community? What is the total number of actions taken by fans in a month? How many minutes of involvement are generated each month? What is the percentage of favorable comments?

Measuring sales that result from social campaigns is somewhat more straightforward. First, measure the percentage of sales that you receive from the social network. You can easily measure the number of visits to your website that originate on the social network and the number of sales that these visits generate. In addition, you can compare purchase rates (conversion rate) for fans to conversion rates for non-fans. More importantly, you can compare the social network conversion rate to that of visitors who come from different marketing channels such as e-mail, display ads, and blogs.

Social marketing has entered its second generation even though it's only about 10 years old. The emphasis today in social marketing has gone beyond collecting Likes and more toward building engagement with high-quality content that fans want to share with their friends; nurturing stable communities of intensely involved fans and friends of fans; and ultimately turning these communities of fans into communities of purchasers. Influencer marketing has introduced new complexities. Lack of a standardized system to measure the impact of influencer marketing campaigns has hindered marketers' ability to determine the return on investment. In July 2022, the Association of National Advertisers (ANA) introduced the industry's first set of guidelines to help measure influencer marketing. The guidelines cover metrics with respect to awareness (covering total reach, cost per reach, total video views, and total impressions), engagement (cost per engagement, overall campaign sentiment, and engagement rate), and conversion (total traffic generated, total conversions, cost per conversion, total sales generated, and return on investment) (ANA, 2022).

There are a variety of social media analytics tools that provide valuable information about your social marketing efforts. Social media management system HootSuite enables teams to conduct marketing campaigns across multiple networks from one dashboard and also provides custom reports. Major analytics providers, such as Google Analytics, Webtrends, and IBM Digital Analytics, also provide social marketing reporting modules. Read the *Insight on Technology* case study, *Optimizing Social Marketing with Sprout Social*, for a further look at how one organization is providing various analytics tools to help their clients better understand social marketing. In addition, each of the various platforms has built-in analytics tools that enable marketers to measure the success of marketing efforts. For example, Meta's Business Suite allows businesses to manage their Facebook and Instagram business accounts and also provides detailed insights about audience, content performance, and trends. Tools provided by Twitter include a dashboard that presents real-time information on impressions, retweets, clicks, replies, follows, and followers. Pinterest provides a built-in web analytics service that offers insights into how people are interacting with pins that originate from their websites.

FACEBOOK MARKETING

Most people reading this book have a Facebook profile. There are power users who spend hours a day on Facebook, some with thousands of "friends," and there are casual users who have a small set of perhaps 20 friends and relatives. Although most users have a basic understanding of Facebook, it's worthwhile to review the major features of Facebook that are important in terms of using Facebook as a marketing platform **Table 7.2** on page 405.

Many of the features listed in Table 7.2 encourage people to reveal personal information about themselves, including their activities, behaviors, photos, music, movies, purchases, and preferences. One result is that Facebook is the world's largest repository of deeply personal behavioral information on the Internet. Facebook knows a great deal more about its users than Google knows about its users. Second, Facebook's features are built to maximize the connections among people in the forms of notifications, tags, messages, posts, and shares. In many instances, the movement of personal information is so widespread that it is beyond the understanding of users and outside observers. The effect of these two factors is to greatly magnify the social density of the Facebook audience.

INSIGHT ON TECHNOLOGY

OPTIMIZING SOCIAL MARKETING WITH SPROUT SOCIAL

Companies of all shapes and sizes are now tapping into the power of social media for marketing and advertising to improve their bottom lines and enrich their relationships with their customers. As social media continues to become entrenched in the business and cultural landscape, an ecosystem of companies has sprung up around it to meet the growing demand for social marketing. One major area of growth is in social media analytics—tools that allow companies to track and report social media account performance and generate recommendations on how to optimize social media marketing efforts. Sprout Social is a market leader in this burgeoning field.

Founded in 2010, Sprout Social is based in Chicago, Illinois, and has grown from just another startup into a public company with almost 900 employees, more than 31,000 customers in more than 100 countries, and revenue of $188 million in 2021. Sprout's rapid growth mirrors the growth of social media platforms since the company's creation. Marketers eager to tap into the emerging social media channel often lack the tools necessary to understand what techniques are working and which are not. Sprout seeks to help businesses solve this problem.

Sprout offers a number of core services to its clients via its cloud-based applications, which allow users to manage their profiles on multiple social networks within a single interface. Sprout's most commonly used features are its social media marketing suite of tools, which allow marketers to easily create, schedule, and publish content with the aid of analytics that ensure that content is distributed at the most effective time of day and with the optimal return on investment; its social media engagement tools, which allow marketers to view messages and notifications across all major social networks at once; its social customer service tools, which allow marketers to connect with individual customers and to assign messages to other team members who can best answer questions and solve customer problems; its social media reporting and analytics tools, which allow marketers to generate reports that measure just about any component of their social media strategy; and its social listening and business intelligence tools, which enable marketers to monitor mentions of their brands on social media. Sprout also offers a tool called Bambu, which allows managers to distribute content to their employees using a central platform where employees can then share that content on social networks, as well as its Landscape tool, which automates the resizing of images for different social media platforms.

Sprout offers highly customized products for different types of customers. First, Sprout has different offerings for different business types, serving small businesses, large enterprise clients, and marketing agencies. Sprout also features separate product suites that are focused on specific social networks for clients who are not interested in solutions that manage several social media accounts at once. Finally, Sprout offers several pricing models, ranging from a $89-per-month Standard plan to a $149-per-month Professional plan and to the high-end $249-per-month Advanced plan. Sprout's tools integrate fully with other standard social marketing tools, including Google Analytics, Zendesk customer service software, UserVoice customer engagement tools, and Bitly link-shortening and custom

(continued)

(continued)

URL services. Sprout also maintains official partnerships with all of the major social networks, including Facebook, Instagram, TikTok, Twitter, Pinterest, and LinkedIn. Whatever a company's social marketing needs, odds are good that Sprout Social has solutions to help.

The Atlanta Hawks basketball team is a well-known brand that uses Sprout Social. The Hawks wanted to tap into new social audiences and turned to Sprout Social to do so. The team relies on Sprout's sophisticated tagging functionality to obtain detailed information on content performance by type, theme, and campaign. Sprout's reporting tools have allowed the Hawks' social media group to quickly identify audience preferences. Being able to assess the performance of different types of content enables the team to be smart about what it posts. Sprout's A/B testing functionality (see Chapter 4) enables the team to try out different approaches to see what works best. For example, the team recently tested social videos that have a more casual approach than some of the more polished videos it shared in the past. The team was surprised to learn that there was a lot more success with the casual-content format. The team also relies on Sprout's Social Listening tool to get a more complete picture of a large campaign such as a jersey launch. For instance, when the team launched the Martin Luther King Jr. Nike City Edition jersey, the team was gratified to discover that the jersey launch was met with 99% positive sentiment. Overall, Sprout helped deliver a more than 125% increase in video views from December 2021 to February 2022 as well as a 170% increase in audience growth on Facebook during the same time period.

Allegiant Air is another company that has benefited from using Sprout Social. Allegiant is a Las Vegas–based airline known for its low cost and a la carte service. Being accessible on social media is a key part of its customer care and engagement strategy and enables Allegiant to respond to and help retain its customers as well as to build brand loyalty. About 15% of its customer inquiries come to Allegiant through social media channels. Allegiant turned to Sprout Social in 2020 to help it deal with the business disruptions caused by the Covid-19 pandemic. Sprout's Smart Inbox tool enabled Allegiant to handle a sharp increase in messages, allowing Allegiant to drastically increase the number of messages it could reply to across platforms (particularly Facebook and Instagram), with a 77% increase in the number of messages it responded to in the third quarter of 2021 compared to the number of messages it responded to in the third quarter of 2019—even though it had the same number of customer service agents. Sprout is also integral to another part of the brand loyalty spectrum—that of identifying customers who share their positive experiences with Allegiant on social media. Sourcing and sharing user-generated content have become smoother processes involving the content marketing and the customer relations teams at Allegiant.

Using social media correctly can be difficult (see the Chapter 11 *Insight on Society* case, *Businesses Beware: The Dark Side of Social Networks*, for examples). With Sprout Social and other social media analytics providers, avoiding these pitfalls and getting the most out of social media become much easier.

SOURCES: "About Sprout," Sproutsocial.com, accessed September 10, 2022; "How Allegiant Air's Customer Relations Team Is Taking Flight with Sprout Social," Sproutsocial.com, accessed September 10, 2022; "How the Atlanta Hawks Created a Slam Dunk Social Strategy Using Sprout Social," Sproutsocial.com, accessed September 10, 2022; "Sprout Social Inc. Form 10-K for the Fiscal Year Ended December 31, 2021," Sec.gov, February 23, 2022; "The Unprecedented Rise of Sprout Social Inc," by Robyn Ryan, Oracledispatch.com, June 18, 2020; "What's Next for Sprout Social," by Justyn Howard, Sproutsocial.com, December 13, 2019; "How 4 Brands Optimized Their Social Strategy with Sprout," by Katherine Kim, Sproutsocial.com, December 4, 2019; "Sprout Social Inc. Form S-1 Registration Statement," Sec.gov, October 25, 2019.

TABLE 7.2 BASIC FACEBOOK FEATURES USED IN MARKETING

FEATURE	DESCRIPTION
Profile	As part of account creation, you create a profile that includes certain personal information. The profile may also include photos and other media. Establishes baseline information that will be shared with friends.
Timeline	A history of your actions on Facebook, including status updates, photos, history of posts, and comments, as well as life events that you post and want others to see as a part of your profile. Additions you make to your Timeline may appear on your friends' Feed. Creates additional links with friends.
Tagging	Ability to tag photos, status updates, check-ins, or comments with the names of friends. Tagging links to that person's Timeline and Feed. Your friends are notified that they have been tagged, and you are linked to their Timeline. Friends of your friends may also be notified. The tagging tool is designed to create additional connections among users.
Feed	Facebook's Feed (formerly called the News Feed) is a continuously updated list of stories from friends, Groups, and Pages that you have Liked on Facebook. Ads running in the Feed are a major ad-revenue producer for Facebook. The Feed includes status updates, photos, videos, links, app activity, and Likes. Provides a continuous stream of messages from friends and advertisers.
Groups	Facebook Groups provide a platform for people with common interests to share content with one another. Any Facebook user can set up and manage a group. Groups may be public or private (open only by invitation) or secret (not able to be searched for).
Reactions buttons	In addition to the familiar Like button, users can now indicate additional reactions such as Love, laughter (Haha), surprise (Wow), sadness, and anger.
Stories	Photos and videos that remain visible for only 24 hours. Supports videos of up to 20 seconds; each photo is displayed for 5 seconds.
Reels	Platform for creators (and brands) for short, entertaining video. Appear in Feed, the Reels section, or the Reels profile. Ads can be placed as a banner or a sticker. Video ads can be placed between Reels video.
Facebook Live	Free video streaming service that lets users livestream to a page, group, profile, or event via the Facebook app on a mobile device or using a desktop computer.
Facebook Watch	Video-on-demand service that includes professionally produced original short-form and long-form video, live game shows, news programming, interactive game shows, and more. Facebook Watch offers advertisers both pre-roll and mid-roll advertising options.
Messenger	Instant messaging app, used by more than 1.3 billion people every month. Offers a variety of marketing options, including sponsored messages from chatbots, in-box video and display ads, and broadcast messages from small- and medium-sized businesses.

social density refers to the number of interactions among members of a group and reflects the "connectedness" of a group even if these connections are forced on users

Social density refers to the number of interactions among members of a group and reflects the "connectedness" of a group even if these connections are forced on users. For instance, some natural groups of people are not very "social," and few messages flow among members. Other natural groups are loquacious and chatty, with many messages flowing among members. The scope, intensity, and depth of Facebook's repository of personal information and rich social network present extraordinary marketing opportunities. However, the use of Facebook as a marketing platform has been negatively impacted

by Apple's App Tracking Transparency (ATT) project, which limits the data that Facebook receives about the off-platform actions of app users who have opted out of tracking.

The Reactions and Share buttons on Facebook, and similar buttons on other social networks, are perhaps the single-most-important element in the rise of social marketing. "Like" is the engine of social marketing. The Like button was introduced by Facebook on its own website in 2009 and rolled out as a plug-in to other websites in 2010. In 2016, Facebook added five additional buttons (Love, laughter [Haha], surprise [Wow], sadness, and anger) and rebranded the Like button as Reactions. Unlike traditional online advertising, the **Reactions buttons** give users a chance to share their feelings about the content and other objects that they are viewing and the websites they are visiting. For instance, the Like button communicates your support of comments, photos, activities, brands, articles, and products to your friends and also to the Facebook social graph and third-party marketers. The Reactions buttons are available on virtually all Facebook content, including status updates, photos, comments, brands, timelines, apps, and even ads. The ubiquitous Like button also appears on external sites, mobile and social apps, and ads. These sites are utilizing Facebook's Social Plugins, and when you Like something outside of Facebook, it appears on your Timeline, where friends can comment on the activity. The Like button is one way that Facebook knows what other sites you visit (Zara, 2019). The Reactions buttons provide amplification for marketing messages. However, they can be a double-edged sword, as they are not a tool that marketers can control.

Reactions buttons give users a chance to share their feelings about content and other objects that they are viewing

Facebook Marketing Tools

Facebook offers a number of marketing and advertising opportunities and tools for branding and developing community on its platform. Brands can get exposure on Facebook either organically or via paid advertisements. Organic reach is free and takes place when fans see the brand's updates and posts in their Feed or when others who are not fans see that content because a fan liked, commented, or shared the post (viral reach). In order to ensure that they get the exposure that they want for their marketing messages, most companies choose one of Facebook's paid advertising formats.

Brand Pages Facebook's early efforts at brand marketing focused on the development of brand pages as a means for firms to establish a direct relationship with their current and potential customers. Nearly all Fortune 1000 companies, and hundreds of thousands of smaller firms, have Facebook brand pages as an adjunct to their main website. The purpose of a brand page is to cultivate fans of the brand by providing users with opportunities to interact with the brand. Using social calls to action, such as "Like us on Facebook" and "Share," brand pages can escape their isolation and make it more easily into users' social networks, where friends can view the message. In 2015, Facebook began offering a Shops tab for Facebook brand pages that features products and services for sale, taking Facebook further into the realm of social e-commerce. Brand pages provide engagement and community building.

Social brand pages have many more social opportunities for fans to like and comment than is true of traditional web pages. However, corporate websites have, over time, adopted many social features, to the extent that web pages and Facebook brand pages are now often indistinguishable. However, brand pages on Facebook typically attract more visitors than does a brand's website.

Facebook Groups Many brands also create a Facebook Group for their brand. A Facebook Group gives brands a platform and tools to build an engaged community among existing and potential customers. Groups provide a hub for social listening and, in the best of worlds, create a space for customers to become brand advocates. Groups can be either public or private. For example, Tonal, a fitness company that offers a home digital strength training system, created a private "official" Facebook Group to motivate and interact with customers. The group has grown to more than 44,000 members. According to Tonal, the group has been instrumental in collecting member feedback and building brand loyalty (Meta, 2022).

Facebook Ads Facebook Ads enables businesses to choose from a variety of different marketing objectives, such as building brand awareness; getting people to click through to the company's website; getting people to take certain actions on a website; getting people to install an app; getting people to use an app; creating offers for people to redeem; and getting people to watch a video.

After you have chosen a marketing objective, your next decision is to whom you want to target the advertisement. Facebook ads can be targeted based on location, age, interest, gender, education level, relationship status, and political views as well as to custom audiences defined by the marketer. Facebook can also create what it calls a lookalike audience based on demographics shared with the custom audience that was identified by the marketer. In 2018, after the Cambridge Analytica scandal (see the *Insight on Society* case, *Facebook and the Age of Privacy*, in Chapter 1), Facebook introduced a Custom Audiences certification tool that requires marketers to guarantee that e-mail addresses used for ad targeting were obtained with user consent. Facebook is also reportedly developing ad options that will use less user data for targeting.

After the marketing objectives and audience have been determined, the next decision is the type of ad and where to place it. Facebook ads typically consist of photos and/or videos. Video ads have become an increasingly important part of Facebook advertising strategy. Video ads command a premium and therefore generate more revenue. One challenge has been that video ads autoplay in silent mode, requiring advertisers to adapt their video to that medium. Another challenge has been the issue of metrics. Facebook has admitted that in the past, it had overestimated the average viewing time of video ads, possibly by 60%–80%, because it had been including only video views of more than three seconds in its metric. Facebook agreed to undergo regular audits by the Media Rating Council, an industry group that certifies ad metrics, and to provide to independent, third-party measurement companies more detailed data, such as how many ads are viewable, how long ads appear on screen, and whether audio is on for the ad. Photos and videos can also be combined into a Carousel format that lets brands showcase up to 10 images or videos in a single ad, each with its own link. Slideshow ads are video-like ads that include motion, sound, and text.

Ads can be placed in the Feed, in the right-hand column or sidebar section of Facebook pages, in Stories, in Reels, and on Messenger. Video ads can also appear on Facebook Watch. Ads can also be placed within apps. The Feed is the most prominent place for advertisements. The Feed is the center of the action for Facebook users and is where Facebook users spend most of their time because that is where posts from their friends appear. Ads appear in a user's Feed along with all of the other posts and status updates that appear from friends. Ads also have a tiny tag that indicates that they are sponsored (i.e., are advertisements), but otherwise they look very similar to posts from friends. Sometimes the ads have a social context ("John Smith and Jane Doe like Pottery

Barn") and can be liked, shared, and commented on, just like any other post. Ads can contain text, photos, video, and links. They can be used for many of the marketing objectives mentioned previously, such as increasing brand engagement, obtaining Likes for the brand's Facebook page, and encouraging app installs and engagement. Advertisers can also include various call-to-action buttons, such as a Shop Now button. Companies pay to promote or boost Ads in order to extend their reach. This has become increasingly important because, in an effort to increase advertising revenues, Facebook has reduced the organic reach that brands previously enjoyed for free.

Right-hand-column sidebar ads are often used to direct users to off-Facebook content such as website landing pages and content offers. In an effort to enhance ads' performance, Facebook has recently reduced the number of ads that appear in the right-hand-column sidebar from seven to two, has increased their size, and has made them consistent with the format of ads in the Feed.

Facebook introduced its Facebook for Mobile app in 2007. Users can also access Facebook using a mobile browser. In 2022, more than 97% of Facebook ad revenue is expected to come from its mobile ad platform, which is Facebook's fastest-growing revenue stream. Mobile ads can include many of the ad formats described previously. Facebook Instant Experience ads, designed for mobile, are full-screen and designed to capture the viewer's complete attention.

In 2016, Facebook began allowing companies to deploy chatbots on the Messenger app to provide automated customer support and other e-commerce services and introduced Sponsored Messages, which allow companies to send messages to customers who had previously engaged with them. Facebook also launched a Buy Now button for the Messenger app that enables customers to make payments via Stripe or PayPal to companies advertising on Messenger without having to leave Messenger. In 2017, Facebook added display ads in Messenger in-boxes, and in 2018, Facebook introduced autoplay video ads within Messenger in-boxes, as well as Broadcasts, which allow small businesses to send text blasts.

Facebook Live Facebook introduced Facebook Live, its free video streaming service, in 2016. Since that time, there have been more than 8.5 billion broadcasts on the service, and it is the second-most-popular livestreaming platform, topped only by YouTube (McDermott, 2022; Wong, 2020). Facebook Live can be used to stream live content that followers can interact with by commenting, liking, and sharing. The video can be saved on a brand's page, and followers can continue to interact with it.

Starting a Facebook Marketing Campaign

Prior to starting a Facebook marketing campaign, there are some basic strategy questions you need to address. Although every product presumably could benefit from a social marketing campaign, how is this true of your products? Who is your audience? How can you reach them? How have real-world social networks been used in the past to support sales in your industry? Can you be a "thought leader"? After you have identified your audience, what content will get them excited and interested? Where are you going to get the content? What will it cost, and what impact do you expect it to have on your brand and sales? At this point you do not need a detailed budget, but you should be able to develop estimates of the cost of, as well as the anticipated revenues from, such a campaign.

If you're new to Facebook marketing, start simple and build on your fan base based on experience. A typical marketing campaign on Facebook for a new business might include the following elements:

- Establish a Facebook page for your brand. Content is king: Have interesting, original content that visitors can be enthusiastic about. Acquire fans. Install the Meta pixel on your website, which will allow you to track, test, target, and analyze Facebook ads.
- Use comment and feedback tools to encourage fan comments. You want visitors to engage with your content. You can also encourage bloggers to develop content for your page.
- Encourage brand involvement through videos and rich media showing products being used by actual customers.
- Use contests and competitions to deepen fan involvement.
- Set up a Facebook Ads account (now part of Meta Business Suite).
- Define your audience and goals.
- Try boosting a post, which takes a regular Page post and turns it into an ad. Boosting a post is relatively inexpensive and enables you to test the waters.
- Create a Facebook ad campaign.
- Using Facebook Groups, develop a community of fans. Try to encourage fans to talk with one another and to develop new (free) content for your page.

Table 7.3 provides some examples of Facebook marketing campaigns.

TABLE 7.3 SELECTED FACEBOOK MARKETING CAMPAIGNS

COMPANY	MARKETING CAMPAIGN
Naked Juice	Naked Juice, a premium juice and smoothie brand distributed by PepsiCo, wanted to boost brand awareness. Used photo and video ads that ran for 15 seconds or less and had large text overlays that made the action understandable in both sound-on and sound-off environments. All ads included a Learn More button that linked to the Where to Buy page on Naked Juice's website. Ads were delivered in users' Feeds. The campaign delivered a 3.7-point lift in brand awareness and a 3.2-point increase in positive sentiment toward the brand.
Really Good Stuff	Really Good Stuff, an e-commerce brand offering a wide variety of teacher supplies, wanted to boost awareness of its brand and its Wishing Well program, which enables teachers to create wish lists of needed supplies that anyone can choose to contribute to. Used a three-phase ad strategy with video and photo ads in various formats such as the Carousel format. Objectives were to drive brand awareness among teachers, to encourage teachers to sign up for its Wishing Well program and create wish lists, and to encourage contributions from parents. It used Facebook's custom audience functionality and campaign budget optimization to automatically distribute the budget across the best-performing ad sets in real time. Campaign resulted in a 12-point increase in purchase intent, a 7.2-point increase in campaign awareness, and a 15-point increase in ad recall.
HP	HP, which manufactures and sells printers, PCs, monitors, and IT solutions and services to consumers and businesses, wanted to increase brand awareness and purchase intent and sales of its HP Spectre laptop. Used ads that included interactive elements such as polls. When a user clicked one of the poll choices, a pop-up displayed the percentage of other people who had chosen that same option and encouraged the user to swipe up to open the "Learn More" button, which linked to the product page for the HP Spectre. Ads were displayed in Feed and Stories and shown to U.S. adults with an interest in technology and tech products. The campaign resulted in a 12-point lift in ad recall and a 3-point lift in purchase intent.

INSTAGRAM MARKETING

Instagram is a visual social network: Users and advertisers post photos and videos to their friends, potential customers, and the public at large. It is predominately a mobile app, but because it is also owned by Meta (Facebook's parent), Instagram content is easily shared to Facebook as well. In 2022, Instagram has more than 1.25 billion users worldwide and more than 200 million business profiles. Almost 60% of Instagram's audience is younger than 35, but its most rapidly growing demographic groups are those comprised of people older than 35. In 2022, Instagram is expected to generate almost $30 billion in U.S. ad revenues (Insider Intelligence/eMarketer, 2022e).

Table 7.4 describes various Instagram features that are important in terms of using Instagram as a marketing platform. As with other social networks, users create a profile. There is a Feed that provides a listing of photos and videos (up to 15 seconds long) posted by friends or advertisers. Using a feature called Instagram Direct, users can send photos and videos to specific people. Using Explore, users can search for public profiles and photos. Instagram also has an impressive photo-editing suite called Layout.

TABLE 7.4 BASIC INSTAGRAM FEATURES USED IN MARKETING

FEATURE	DESCRIPTION
Profile	As part of account creation, you create a profile that includes certain personal information. Includes a history of photos and videos that you have posted and that others can see as a part of your profile.
Feed	A continuously updated list of posts including photos and videos from friends and brands that you follow on Instagram. Ads running in the Feed are a major ad revenue producer for Instagram. Feed posts can be made shoppable with the inclusion of product tags that let people browse, explore, and purchase without leaving Instagram.
Stories	A feature originally copied from Snapchat. Video, images, stickers, graphics, as well as various forms of interactivity such as polls and quizzes, that remain visible for only 24 hours. Supports videos of up to 20 seconds; each photo is displayed for 5 seconds. More than 500 million people use Stories every day. Stories Highlights enables Stories to be saved at the top of the profile page.
Instagram Live	Part of the Stories feature. Live broadcasts.
Instagram Video	Combines IGTV and long-form, in-feed videos. Houses all video content except Reels.
Reels	Platform for creators (and brands) for short, entertaining videos. Appear in Feed, the Reels section, or Reels profile. Ads can be placed as a banner or sticker. Video ads can be placed between Reels videos.
Tagging/Tagged tab	Ability to tag photos with the names of friends. Tagging links to that person's account and Feed. Your friends are notified that they have been tagged. The tagging tool is designed to create additional connections among users. The Tagged tab shows all the posts that other users have tagged you in.
Hashtags	A combination of letters, numbers, and/or emoji preceded by the # symbol, used to categorize content and make it more discoverable. Anyone who clicks on an Instagram hashtag or conducts an Instagram hashtag search will see a page showing all posts tagged with that hashtag. Can be used to build community, expand audience, and get more reach.
Filters	Offers 40 different photo filters that enable brands to create different looks and feels for their photos. Augmented reality (AR) filters are also available.
Instagram Direct	In-app messaging that allows brands to privately exchange text, photos, posts, and Stories with one or more people, thus strengthening customer relationships and increasing sales via personal connections.

Instagram Marketing Tools

Similar to Facebook, advertisers on Instagram have brand profiles and run marketing campaigns by sending posts to users' Feeds. Instagram ad campaigns consist of display ads and video ads of exceptional quality, similar to those in a printed magazine. Carousel ads can include multiple still photos or videos in a single ad. Ads can link to advertisers' websites and now can include a Buy button. Instagram also offers Stories as a paid advertising product. Instagram Stories typically include a montage of images and/or videos, sometimes annotated with graphics and emoticons, and disappear after 24 hours. Major brands have eagerly embraced the format and regularly include Stories in their Instagram marketing efforts. Influencer marketing is also a major method of marketing on Instagram.

Starting an Instagram Marketing Campaign

Prior to starting an Instagram marketing campaign, you should address all of the same basic strategy questions that you would address when starting a Facebook marketing campaign. After you have done so, here are some basic steps and elements involved in a typical marketing campaign on Instagram.

- Set up a free Instagram business profile. If possible, get verified, which helps to establish trust with potential customers. Choose a high-quality photo, and include a call to action to click the profile's bio link. Make sure that the bio provides an engaging summary of your brand.
- Try an Instagram ad. You can turn any existing Instagram post into an ad by using Instagram's Boost Post functionality.
- To launch a full Instagram ad campaign, connect the Instagram account to Meta Business Suite, which enables you to choose various goals, such as building brand awareness, getting more website visitors or purchasers, getting more leads, and so on. For a first campaign, there is an Automated Ads option. When you select this option, Instagram tries to get the best results with the smallest budget possible and auto-adjusts targeting and bidding strategies as it learns from your audience's reactions. After you have more experience with developing a campaign on Instagram, you can also choose other targeting options.
- Create the ads. Instagram provides prompts to help with this process, depending on the goal that you select. Typically, ads include a mixture of photos, videos, Stories, Reels, and, if you sell products online, catalog and shopping ads.
- Set the budget and duration. Instagram will provide a prediction of results in terms of estimated reach and clicks.
- Partner with influencers to extend your reach.

Table 7.5 provides some examples of Instagram marketing campaigns.

TIKTOK MARKETING

TikTok is one of the newer social networks. Launched in 2017, TikTok is a short-form video sharing app owned by Chinese company Bytedance. It already has more than 800 million active monthly users worldwide, with about 95 million in the United States. Many TikTok videos feature music, with users lip-syncing, singing, and dancing; others focus on comedy and creativity within the 15-second limit of each video. Users can

TABLE 7.5 SELECTED INSTAGRAM MARKETING CAMPAIGNS

COMPANY	MARKETING CAMPAIGN
La Mer	La Mer, a luxury skincare brand, wanted to drive higher awareness into the brand's association with ocean conservation (one of the brand's primary ingredients is sea kelp). On World Ocean's Day, created an add to showcase its partnership with GreenWave, a nonprofit organization dedicated to developing regenerative kelp farming techniques, using Meta's Immersive Experiences format with Learn Move and Dive Deeper buttons that enabled viewers to donate straight from the ad unit. Showed the ads to U.S. adults, as well as a custom audience of adults with an interest in beauty and sustainability, as well as to a lookalike audience with characteristics similar to its top recent customers and repeat customers. Ads were delivered in Feed and Stories, using campaign budget optimization. Also used an Instagram Live fundraiser. Campaign resulted in a 1.4-point lift in how consumers rated the brand in terms of commitment to ocean conservation, a 10.8-point lift in ad recall and a 3x increase in landing page visits.
Silk	Silk, which produces plant-based food products, wanted to boost awareness of Silk Oats, its rebranded oat milk product. It used an interactive augmented reality (AR) ad that allowed viewers to try filters themselves. The ads featured a variety of influencers and were delivered as both branded and non-branded content from the influencers' own accounts, as well as from Silk's account. Ads were shown to U.S. adults and to a custom audience of plant-based and non-dairy enthusiasts. Campaign resulted in a 2.3-point lift in brand awareness and a 9.2-point lift in ad recall.
Plantin	The Plantin app is a gardening app that helps people identify plants and plant diseases, and to care for their gardens. The Plantin team used Instagram's Reels to encourage potential users to download the app and subscribe for a free trial. The Reels ad achieved 3x lower cost per trial subscription, a 26% lower cost per 1,000 views and a 31% lower cost per app install compared to a standard Instagram ad campaign.

"remix" posts from other users and put their own spin on them using the app's array of editing tools, filters, and other effects. Algorithms analyze the viewing habits of each user and provide content that is customized based on their activity. TikTok skews much younger than the other social networks. In the United States, more than 40% of its users are between the ages of 12 and 24. TikTok offers a variety of ad formats, including in-feed video, similar to that created by users; brand takeovers, an immersive, full-screen ad format that appears when the app is launched, including a version that fades into an in-feed video ad; a branded Lens (similar to Snapchat's lens); and hashtag challenges, including a shoppable version. Many major brands have begun to use TikTok, including Walmart, the National Football League, Ralph Lauren, Macy's, Kroger, and Chipotle.

Table 7.6 describes various TikTok features that are important in terms of using TikTok as a marketing platform.

TikTok Marketing Tools

TikTok's first push into advertising was with lead generation ads, which allow advertisers to collect information from potential customers and prospects via customized messaging. TikTok has since expanded its ad options and now offers most of the same ad

TABLE 7.6 BASIC TIKTOK FEATURES USED IN MARKETING

FEATURE	DESCRIPTION
Profile	User account, including bio with link to website
For You Page and Algorithm	TikTok's For You Page is determined by an algorithm that makes content recommendations that are personalized for each user. The algorithm is based on the user's video likes and shares, accounts followed, comments posted, content created, videos completed, and videos that are favorited by the user. The algorithm is a important component in the ability of certain videos to "go viral."
Tagging	Ability to tag other accounts, such as influencers and content creators. Also useful when reposting user-generated content in order to give credit to original creators.
Hashtags	A combination of letters, numbers, and/or emoji preceded by the # symbol that is used to categorize content and make it more discoverable. Anyone who clicks on an Instagram hashtag or conducts an Instagram hashtag search will see a page showing all posts tagged with that hashtag. Can be used to build community, expand audience, and get more reach.
Filters and Effects	TikTok offers traditional filters that can change the color tone of videos and photos, as well as many interactive effects such as the green screen filter effect that enables a creator to add a custom background. Has also added new augmented reality effects.
Stitch and Duet	TikTok features that enable users to interact with videos. Stitch allows users to cut and edit other people's videos and incorporate them into their own content. Duet is an editing format that enables users to combine two videos in a split-screen format.

formats as other social network platforms do. In-feed ads include image ads, video ads, and spark ads (boosting content that has already been posted). There are also carousel ads and Pangle ads (which run in third-party apps and are available in select countries, including the United States). Additional ad formats available for brands include TopView ads (which play when the app is first opened and cannot be skipped), Branded Hashtag Challenges (an actionable hashtag that's connected to a brand), and branded effects, such as stickers and filters. In March 2022, TikTok began testing search ads with select partners. These ads are tagged with a sponsored label and show up above the "Others searched for" term listings on the search results page.

Starting a TikTok Marketing Campaign

TikTok is very different from Facebook, Instagram, or Twittter, It has a number of unique features, such as the TikTok algorithm, as well as unique user demographics (the majority of its users are younger than 30) and behaviors. Although TikTok now offers a variety of advertising options, marketing on TikTok is driven primarily by influencers and viral videos. To start a TikTok marketing campaign:

- Create a profile.
- Start creating and posting video content, paying particular attention to hashtags, filters, and effects.

- Partner with creators and influencers.
- Comment regularly, and encourage comments in your posts.
- Launch organic hashtag challenges, including social media contests to encourage participation.
- Start trying some of TikTok's ad formats, such as in-feed ads, and for larger companies, brand takeovers, TopView ads, and Branded Hashtag Challenges.

Table 7.7 provides some examples of TikTok marketing campaigns.

TWITTER MARKETING

Twitter is a social network originally based on 140-character text messages. It now allows users to send and receive 280-character messages as well as news articles, photos, and videos. Twitter had around 230 million daily active users worldwide as of June 2022. In 2021, Twitter generated about $4.56 billion in revenue worldwide, almost all of which

TABLE 7.7 SELECTED TIKTOK MARKETING CAMPAIGNS

COMPANY	MARKETING CAMPAIGN
PepsiCo	Beverage distributor PepsiCo wanted to create excitement and product awareness around the introduction of its Nitro Pepsi soft drink, a nitrogen-infused soda. PepsiCo decided to employ a Branded Hashtag Challenge, #SmoothLikeNitro Pepsi. For the challenge, PepsiCo collaborated with The Elements, a TikTok Sound partner, to create an original 15-second song as the official anthem for the campaign. The song contained key product elements such as a can opening, a soda being poured, and fizzy sound effects. To drive engagement, PepsiCo used various types of TikTok ads, including TopView and In-feed Ads, which encouraged users to visit the Challenge and Music pages. PepsiCo also worked with popular influencers to kick off the challenge. The campaign resulted in more than 3.4 billion video views with almost 100 million in reach, 2.2 million videos created, and more than 1 million creators during a two-week time period.
RayBan	Sunglasses brand RayBan used a Branded Hashtag Challenge to maximize awareness, reach, and engagement, creating #RayBanElevatorDance. To augment the challenge, RayBan partnered with a number of influencers to inspire the community to take part in the challenge. The campaign generated 15.3 billion views, with more than 3.2 million videos created by TikTok users.
Motorola	Mobile device manufacturer Motorola wanted to raise awareness of its new Edge+ phone and used the hashtag #FindYourEdge. The campaign employed a wide variety of TikTok ad formats, including TopView Ads, which provided a full-screen, sound-on video takeover ad featuring an 18-year-old high school student and creator and showing how he used his Edge+ to film his TikToks and do his schoolwork. The #FindYourEdge hashtag challenge was promoted via a TopFeed ad that allowed Motorola to reach an audience of tech enthusiasts with a first-in-feed ad slot with every app open. Motorola increased performance by using other TikTok tools to optimize clicks to its website, Moto.com. The campaign increased ad recall and awareness, creating strong brand lift and delivering quality site visits. The hashtag challenge resulted in 2.5 billion video views, while the TopView ad delivered 190 million impressions that reached more than 57 million people in one day.

comes from ads that appear in users' timelines (tweet stream). See the case study at the end of Chapter 2 for more information on Twitter.

Twitter offers advertisers and marketers a chance to interact and engage with their customers in real time and in a one-to-one manner. Advertisers can buy ads that look like organic tweets (the kind you receive from friends), and these ads can tie into and enhance marketing events like new product announcements or pricing changes.

Although most people probably know what a tweet is, Twitter offers marketers many other ways of communicating using Twitter. In fact, Twitter has introduced a whole new vocabulary that is specific to Twitter's platform. **Table 7.8** describes the most common Twitter features used for marketing.

TABLE 7.8 BASIC TWITTER FEATURES USED IN MARKETING

FEATURE	DESCRIPTION
Tweet	Text message that can be up to 280 characters long. Messages can be private (to a single person, or one to one), public (to everyone, one to many), or to a group of followers.
Followers	You can follow someone's tweets and receive them as soon as they are made. Others can follow your tweets.
Direct Message (DM)	A direct private message (DM) is like an e-mail that only you and the recipient can read.
Hashtag	Twitter was the first social network to use hashtags, which organize the conversations on Twitter around a specific topic. Click on a hashtag, and you are taken to the search results for that topic.
Mention	A public Tweet that includes another user's name "@username." You can click on mentions and link back to that person's profile. As a public tweet, your followers will be alerted as well.
Moments tab	Curated highlights of what is happening on Twitter at that moment.
Reply	A public response to a tweet using the Reply button. Replies show up on your timeline and on that of the person you are responding to.
Timeline	Your timeline is your home page on Twitter and lists the tweets you have received in chronological order, the most recent first. Click on a tweet in the timeline, and it expands to reveal videos and photos. Place your mouse over a tweet to reply, retweet, or make it a favorite (which is passed on to your followers).
Twitter List	Custom timeline that contains content from only the accounts you choose.
Retweet	Allows you to send along a tweet to all of your followers.
Topics	Twitter setting that allows you to select from a list of topics and then follow trends you are interested in.
Twitter Spaces	Feature that allows you to host live audio conversations with other users.
Links	Twitter has a link-shortening feature that allows you to paste in a URL of any link, and it will be automatically shortened.

Twitter Marketing Tools

There are many kinds of Twitter marketing products, and Twitter is continually creating new ones. The current major Twitter marketing tools include the following.

Promoted Ads Promoted Ads are available in a variety of formats. Advertisers can pay to have their tweets (Text Ads) appear in users' timelines, profiles, and search results. Carousel Ads give advertisers up to six images or videos that are shown in a single space, enabling users to swipe through the ads. Moment Ads allow brands to promote a collection of curated tweets. This format allows brands to tell a longer story and provide more context. Image Ads allow brands to showcase a product or service with a single photo. Video Ads can typically run for up to 2 minutes and 20 seconds, although select advertisers can run Video Ads that are up to 10 minutes long. Video Ads are Twitter's fastest-growing advertising segment and have grown to comprise almost two-thirds of Twitter's advertising revenue.

Pricing typically is on a "cost-per-click" basis, which is based on an auction run by Twitter on the Twitter ad platform and might range from $0.25 to $2 per auction. Promoted Ads can be geo-targeted and also offer keyword targeting that enables advertisers to send the tweets to specific users based on keywords in users' recent tweets or tweets with which they have interacted.

Follower Ads Advertisers can pay to have their branded account suggested to users who are likely to be interested in the account in the "Who to Follow" list, Twitter's account recommendation engine, on the Twitter home page. Follower Ads (formerly named Promoted Accounts) can be targeted by interest, geography, and gender and are priced on a cost-per-follower basis, with advertisers paying only for new followers gained. Prices average about $2 to $4 per follower.

Twitter Takeover Advertisers can pay to move their hashtags to the top of a user's Timeline (Timeline Takeover) or Trends List (Trend Takeover/Trend Takeover+). These products provide a high-impact, 24-hour takeover of Timelines and Trends lists, respectively, and cost on average about $200,000 a day.

Branded Notifications This ad format enables advertisers to have one-to-one conversations via the delivery of time-triggered, automated @mention Tweets that are directed to users who have opted in to receive them. Scheduled notifications are available in three formats: scheduled, subscription, and instant, and can contain all of the Promoted Ad formats described previously. Notifications can be used to recontact followers, to reinforce important dates such as the launch of a new product, and to create a more personal connection and enable conversations with the brand's most interested customers at scale.

Twitter Amplify The Twitter Amplify program enables marketers to show video ads that run prior to or during premium video content. Amplify sponsorships allow advertisers to connect with a single video publisher of the brand's choosing.

Twitter Cards Marketers can embed a "card" into a tweet. When users click on the tweet, a promotional offer appears, and users are asked to sign up for the promotion. Cards are different from display ads because the former are used only by businesses who want to develop

new leads. Twitter Cards always include an offer, such as 50% off your next cup of coffee. This is a one-click process. The users' e-mail and Twitter account names are automatically obtained by Twitter and sent to marketers, who can then follow up with a tweet or an e-mail.

Twitter Live Marketers can use Twitter Live's livestreaming functionality to broadcast product launches, conferences, and other events.

Mobile Because more than 90% of Twitter users access Twitter via a mobile device, all of the previously referenced marketing tools are also mobile ad tools. In addition, Twitter offers mobile app install and app engagement ads, which have been lucrative formats for Facebook as well. Mobile is the primary driver of Twitter's business and the source of most of its revenue.

Starting a Twitter Marketing Campaign

If you're new to Twitter marketing, start simple and build on your follower base using experience as a guide for what works. A typical marketing campaign for Twitter may include the following elements:

- Establish a Twitter account. Start following others you are interested in or conversations that you might want to participate in with #<topic>. Don't expect any followers at first. Your visibility rises as you follow others, who will begin to tweet back or retweet interesting content. Then start retweeting content that you think the group would be interested in, and start encouraging ongoing conversations.
- Try Promoted Ads. Twitter has a very good online ad tool that allows you to define an ad, establish the groups you would like to target, and understand the costs. You might start with a regional or metropolitan Promoted Ad. Test various formats. You don't have to pay for Promoted Ads unless someone clicks on the tweet, so it is up to you to make those clicks count. Direct users to your website, and offer a coupon or a discount.
- Try Follower Ads. This type of ad is relatively affordable and can be used to promote your account to build awareness and attract new followers.
- Twitter Takeover can be very expensive (an estimated $200,000 per day). If your budget will allow it and if your topic is of general interest to a large audience, you can try this tool. Geo-targeting is possible.
- Twitter Cards are something that small and medium-sized businesses can use. If you sell anything locally, from pizza to stationery, make up an offer and create a Twitter Card specifying the geo-location of your business.

Table 7.9 describes some selected Twitter marketing campaigns.

PINTEREST MARKETING

Pinterest provides users with an online board to which they can "pin" interesting pictures. The success of Pinterest is based in part on a shift in consumer behavior that is enabled by new technologies: People talk about brands using pictures rather than words. Large numbers of users are pinning and instagramming about their lives using pictures. You can think of Pinterest as a highly interactive and social online magazine. One difference, of course, is that users (including business firms) contribute all the photos. Pinterest currently has a wide range of categories of boards, from gifts, animals, art, cars,

TABLE 7.9 SELECTED TWITTER MARKETING CAMPAIGNS

COMPANY	MARKETING CAMPAIGN
Comcast	To promote its various cybersecurity solutions, Internet service provider Comcast wanted to encourage small businesses to visit its Security Edge web page. To do so, Comcast used Promoted Ads to boost featured articles about the web page to relevant audiences for an optimized cost. The campaign increased site visits and lowered Comcast's cost per site visit by 78%.
Dune	When the movie *Dune* was about to premier, Dune's producers partnered with Twitter for a week-long takeover of the @TwitterMovies Trend. The film amassed more than 700,000 Tweets globally and 403,000 unique Tweet authors across the globe during premiere week.
Oreo Cookies	Oreo leveraged interest in horoscopes (the topic of around 60 million tweets annually) by sending a Branded Notification that encouraged people to get their "Oreo" horoscopes. By liking Oreo's tweet, a time-triggered, automated response was sent to fans. Using Twitter's AI technology, users' profiles were scanned for unique characteristics, and based on these insights, Oreo created a one-of-a-kind #Oreoscope for each person that opted in. The campaign resulted in 28-times-higher engagement than standard campaigns, and participants were two times more likely to engage with Oreo.

and motorcycles to crafts, food, and men's and women's fashion. Users can pin to these boards, create their own boards, and follow other pinners and boards as well. Firms can create their own brand boards and product pins.

Pinterest has more 430 million monthly active members worldwide as of the end of the second quarter of 2022. Pinterest's visitors are overwhelmingly female: More than 60% are women, but men are its fastest-growing demographic. Its users cover a broad age demographic ranging from grandparents to teenagers, with Millennials forming the largest single segment.

Marketing on Pinterest requires that you understand the basic features and capabilities of Pinterest. **Table 7.10** provides a list of various Pinterest features used in marketing.

Pinterest Marketing Tools

Pinterest's first step into the marketing arena was to offer business accounts that provided additional resources for brands. Today, it continues to offer Brand pages as well as a variety of ad types that businesses can pay to promote. Paid formats include Standard, which showcases products and content in a simple vertical or square image; Carousel, which allows users to swipe through multiple images or videos in a single ad; Video, which is available in standard- and max-width formats; Shopping, which requires advertisers to have uploaded their product catalog to Pinterest; and Collection, which is used by advertisers to display their products in action with a hybrid format that mixes lifestyle imagery and video. Pinterest also offers Search ads. Products for search advertising include keyword campaigns, which are similar to keyword ad campaigns on Google, and shopping campaigns, which take an advertiser's product catalog and automatically match ads to keywords associated with that catalog. Pinterest has also started exploiting its visual search engine for advertising purposes by serving up ads based on a user's organic search based on the visual similarity between the products in the ads and the

TABLE 7.10 BASIC PINTEREST FEATURES USED IN MARKETING

FEATURE	DESCRIPTION
Pins	Used to post to a Pinterest board. Several types, include Standard Pins (photos), Video Pins (short videos), Product Pins (items that can be purchased, which include metadata on price and availability as well as links to product page of retailer's website), and Idea Pins (multi-page display of videos, images, text, and lists that are natively created on Pinterest).
Board	An online scrapbook where Pins are organized by the user.
Home Feed	Enables users to discover Pins that are relevant to their tastes and interests in a scrolling format. Users can choose between Browse (traditional feed) or Watch (immersive feed of full-screen, auto-playing Idea Pins). Both types are powered by machine learning recommendations.
Repins	The ability to pin the photos of other users to your own boards and to share them with your friends.
Hashtags and keywords	Use hashtags in the description of pins (e.g., #cars, #sports cars). Use keywords that people are likely to use when searching for specific content.
Share	Share pinned photos with friends on Facebook, Twitter, and e-mail.
Search	Enables users to find Pins, boards, creators, and brands by typing a query. Search results can be viewed on the Explore tab, which includes relevant Pins personalized to the user, or the Shop tab, which includes relevant Product pins. Another method of search is to tap a Pin on any service to learn more about an idea or image. When a user does this, a feed of visually similar Pins is served beneath the tapped image.
Pinterest Lens	Visual search app that allows users to point their smartphone camera at an item and then tap to see related images or ideas.
Widgets and buttons	Widgets and buttons make it easy for people to pin images from your website.

products in the visual search results. Idea Pins are a new format that enables creators and brands to feature up to 20 pages of video, images, and text in a single pin. Pinterest also continues to offer Rich Pins, an "organic" format that is currently free and that allows companies to embed information, such as current pricing and availability, as well as a direct link to a product page. There are three types of Rich Pins: Product, Article, and Recipe. Product Pins include real-time pricing, availability, and a link to where the item can be purchased. Article Pins include a headline, an author, and a story description. Recipe Pins include details about recipes that you save from your site, such as a title, serving size, cooking time, and a list of ingredients.

Table 7.11 provides a brief description of Pinterest marketing campaigns of selected retailers.

Starting a Pinterest Marketing Campaign

Before leaping into a Pinterest campaign, ask yourself some questions about your products and services, and then identify some strategic objectives for your

TABLE 7.11 SELECTED PINTEREST MARKETING CAMPAIGNS

COMPANY	CAMPAIGN
Pillsbury Baking	Pillsbury Baking wanted to reach home bakers ahead of the all-important holiday season. Pinterest users typically are planners, so Pillsbury ran its seasonal campaign in advance of the actual holiday to capture these users' attention. More than 14 million people in the United States search for baking ideas on Pinterest each month, a key audience for Pillsbury's marketing. Pillsbury employed interest and keyword targeting on Pinterest to deliver recipe-focused content and invested 90% of its budget in video with native-style content. Ads featured how-to recipes with unusual colors, such as red and green "Grinch" fudge. The campaign delivered a five-point lift in Pin awareness and a four-point lift in action intent.
MVMT	Premium watchmaker MVMT had been promoting men's watches on Pinterest for many years. More than 35 million Pinterest users engage with fashion content, and more than 80% of weekly fashion Pinners have made a purchase based on seeing fashion Pins on the platform. When it decided to expand its product line, MVMT tapped into customer insights from its previous experience to identify what had performed best in the past and then curated a catalog of new products and uploaded it to its Pinterest product feed. Customer insight combined with Shopping ads using lifestyle imagery and conversion campaigns lowered MVMT's cost per acquisition by four times compared to its own internal benchmarks.
IT Cosmetics	IT Cosmetics offers a best-selling color correcting (CC) cream and employed Pinterest search ads to reach people when they were actively searching for that sort of beauty product and before deciding which product to buy. It wanted to capitalize on Pinterest's ability to reach new customers in the discovery phase and used keywords across the category to reach and convert a new set of potential customers. It achieved an 84% higher clickthrough rate and a 57% more efficient costs per click. It added before-and-after Pins and content to emphasize product benefits.

Pinterest presence. First, sketch out a vision of what you hope to accomplish with a Pinterest presence. Are you an established company trying to strengthen your brand? Are you the new kid on the block that no one knows and you want to start a marketing campaign? Are your products visual, and can your brand be expressed in a set of pictures? Most products have a visual component, some more compelling than others. Is the consumer accustomed to seeing the products in your industry expressed in photos? For instance, with the growth of food magazines and websites, food increasingly has become a visual experience.

Next, consider the target demographic of your products and services, and compare it to the Pinterest demographic. Currently, more than 60% of Pinterest users are women, and although this percentage might change over time, your offerings will have to be attractive to women. Do your products or services appeal to this demographic?

Think about strategy in your marketspace. What are your competitors doing? Are they on Pinterest? Do they have an effective presence? What types of people follow your competitors, and what are the users pinning? How many followers, re-pinners, brand pages, and product pins are there? Because photos are central to a Pinterest presence,

where will the photos for your brand pages come from? Are you, or a member of your team, a skilled photographer? You can pin photos from all over the Web and from other Pinterest boards, but then you're just sharing content, not creating unique and unusual content.

After you have envisioned your Pinterest campaign and developed a marketing plan, you can start implementing your plan. In order to implement your Pinterest plan, you should have a traditional website where your products are displayed (a catalog) and can be purchased. After your website is in place, you can begin your Pinterest campaign:

- Create a Pinterest brand page. Choose the right category for your content to be shared in, thus enabling your Pins and boards to become more searchable for users looking to discover content similar to that of your business. Brand pages generally do not allow followers to pin photos, only to follow and comment on them. The idea here is to control the content of your brand page. Later, you can add Group boards that allow followers to pin pictures.
- Start pinning photos of your products. Continue to add more pins, and be sure to change them regularly. Be sure that your photos are at the same quality level or better than those of your competitors. If necessary, hire a skilled photographer.
- Create multiple theme-based lifestyle boards. Pinterest is not just a selling platform. It is also an entertainment and branding platform. On theme-based boards you will want others besides yourself to be able to pin.
- Use Pinterest Rich Pins. After you have some experience with Rich Pins, you can experiment with the various types of paid advertising that Pinterest offers.
- Add Pinterest widgets and buttons to your website to encourage fans and followers to pin your photos to their own boards and to recommend your photos to friends.
- Promote the Pinterest account on your other social networks.
- Be social. Join the conversation. Follow other pinners and boards, and reach out in direct messages to people who have liked your pins or repinned your images. Set up group conversations to deepen engagement.
- Try various Pinterest Promoted Pin and other ad options.

MARKETING ON OTHER SOCIAL NETWORKS: SNAPCHAT AND LINKEDIN

There are a great many social networks where products and services can be marketed, the most significant of which include Snapchat and LinkedIn.

Snapchat is a mobile messaging app/social network that allows its users to chat and send images and videos (snaps) that disappear after a relatively short period of time after they have been viewed. Snapchat bills itself as a method for visually capturing important moments and communicating them creatively via a variety of tools such as geofilters (which tailor an image to the user's location) and lenses (a type of augmented reality that allows users to alter their face in a variety of ways). Snapchat was initially aimed at the under-25 demographic, and in 2022, Millennials and Gen Z-ers together represent about 85% of Snapchat's almost-85-million monthly active U.S. users. In addition to targeting a desirable demographic, Snapchat is attractive to advertisers because research indicates that it is also very "sticky."

Since it was initially released, Snapchat has introduced a number of features that present advertising opportunities, including Snapchat Stories (a way for users to simultaneously share snaps, which remain live for 24 hours, with all or just some of their friends), Live Stories (a compilation of snaps from various users at events and locations around the world that are compiled by Snapchat editors into a Live Story that typically has a lifespan of 24 hours), and Discover (unique content from brands chosen by Snapchat). Snapchat offers advertisers a variety of ad types, including Snap Ads (short, 10-second-or-less full-screen vertical video ads that have audio turned on by default), Sponsored Geofilters (geofilters that use brand imagery and messaging), and Sponsored Lenses (lenses that use brand imagery). Interactive versions of Snap Ads (known as Snap Ads with Attachments) are also available and allow a user to swipe to extend the ad to view additional video, an article, a web page, or an app-install offer. Ads can be purchased on a flat-fee or cost-per-thousand (CPM) impressions basis. Snapchat has also introduced a number of ad-targeting capabilities, added third-party measurement partners, and added a self-serve programmatic ad-buying tool. Snapchat is expected to generate around $2.7 billion in ad revenues in 2022 (Insider Intelligence/eMarketer, 2022f).

LinkedIn, while generating far less average engagement, nevertheless attracts a highly educated, professional, and managerial audience that is intensively engaged in careers and employment. LinkedIn is a social network focused on professional networking, where users post their résumés and potential employers hunt for new hires. See the opening case in Chapter 11 for more information on LinkedIn.

As with other social networks, users create a profile, but in this case, the profile includes their professional background, degrees, employment, and skill set. Companies can create a free company profile page that includes a logo, a header image, an About section, and various posts. Companies can also create a showcase page to highlight a specific product or service as well as a Career page (which requires payment) targeted at recruiting. There is a Feed that provides a listing of posts from colleagues and friends and sponsored posts (ads) from firms. Display ads also appear on the right and bottom of the page. Advertisers can use LinkedIn's self-serve advertising platform or can place ads using LinkedIn Advertising Partner Solutions, which provide more variety and ad options than self-service ads and include premium display advertising, sponsored inMail, and ads that urge users to follow a specific company or join a specific group. LinkedIn also provides a publishing platform called LinkedIn Pulse, which allows users to publish articles to expand their brand and thought leadership.

The primary contributions of LinkedIn are developing personal brands for professional managers and creating a marketplace where employers can contact suitable candidates. Advertisers tend to use LinkedIn for branding purposes and typically are not soliciting sales.

THE DOWNSIDE OF SOCIAL MARKETING

Social marketing is not without its disadvantages. Sometimes social media campaigns backfire. One problem is that companies lose a substantial amount of control over what people say about their brands (see the *Insight on Society* case, *Businesses Beware: The Dark Side of Social Networks*, in Chapter 11 for a variety of examples) and also lose control over where their ads appear in terms of other content on social networks. Ads placed on Facebook according to an algorithm can be placed near content that does not

represent the values of the brand. This is not peculiar to social marketing, as advertising using Google's advertising platform faces the same problem. This is very different, however, from TV ads, where brands maintain near complete control. Brand safety is also a concern in influencer marketing. Influencers may make statements, either about the brand or unrelated to the brand, that do not represent the values of the brand, resulting in damage to the brand.

There are also issues related to disclosure of influencer marketing. The Federal Trade Commission (FTC) provides advisory guidelines (Endorsement Guides) with respect to endorsement and testimonial advertising, which includes influencer marketing. Among other requirements, the Guides require an endorser to be an actual user of the product and to fully disclose any material connection between themselves and the brand. The brand may be liable for failing to disclose a material connection with the endorser as well as any false or unsubstantiated statements made by the endorser. Endorsers may be liable for their statement as well. In 2022, the FTC issued several proposed amendments to the Guides, including expanding the definition of an "endorsement" to include a social media user tagging a brand in a post and stating that all brand partnership disclosures must be "clear and conspicuous," among other suggestions. The FTC's updates also urge social media platforms to review or potentially standardize their disclosure tools to ensure that their tools meet the new requirements (Holland & Knight, 2022). The Securities and Exchange Commission (SEC) also regulates influencer marketing when that marketing involves recommending products that can be considered investments. For example, in October 2022, Kim Kardashian agreed to pay $1.26 million to settle an SEC enforcement act based on her failure to disclose that she had been paid $250,000 to promote EthereumMax cryptocurrency tokens on her Instagram account (Michaels, 2022).

The *Insight on Society* case, *Marketing to Children in the Age of Social, Mobile, Local*, illustrates some additional issues with respect to social, mobile, and local marketing, specifically marketing directed at children.

7.3 MOBILE MARKETING

Mobile marketing involves the use of mobile devices such as smartphones and tablet computers to display banner ads, rich media, videos, games, e-mail, text messaging, in-store messaging, QuickResponse (QR) codes, and couponing. Mobile is now a required part of the standard marketing budget. Mobile devices represent a radical departure from previous marketing technologies simply because the devices integrate so many human and consumer activities, from telephoning or texting friends, to listening to music, watching videos, tracking location, and shopping. The more mobile devices can do, the more people rely on them in daily life. About 280 million people in the United States use a mobile device for Internet access (Insider Intelligence/eMarketer, 2022g). One report found that people look at their mobile devices at least 40 times a day. Most mobile phone users keep their phone within arm's length 24 hours a day. For many, it's the first thing they check in the morning, the last thing they check at night, and the first tool they use when there's a question of where to go, what to do, and where to meet up.

INSIGHT ON SOCIETY

MARKETING TO CHILDREN IN THE AGE OF SOCIAL, MOBILE, LOCAL

Social and mobile marketing have given advertisers an arsenal to influence children and gather valuable data. Using custom ads, product characters, videos, games, virtual worlds, and surveys, marketers are aggressively competing for the attention of young minds—in some cases, minds so young that they are unlikely to know when they are being marketed to and when they are being given misleading or even harmful information. But although such tactics may be savvy marketing, they may not be ethical. Research has shown that young children cannot understand the potential effects of revealing their personal information; nor can they distinguish between substantive material on websites or apps and the advertisements surrounding it. Experts argue that it is unethical to advertise to children before they can understand persuasive intent or distinguish between advertising and the real world.

In 1998, Congress passed the Children's Online Privacy Protection Act (COPPA) after the Federal Trade Commission discovered that 80% of websites were collecting personal information from children but that only 1% were requiring their parents' permission. COPPA was implemented by the FTC through its Child Online Privacy Protection Rule, which first took effect in 2000. Under COPPA, companies must post a privacy policy on their websites that details exactly how they'll collect information, how they'll use that information, and the degrees to which they'll protect user privacy. Companies are not permitted to use personal information collected from children younger than 13 years of age without the verifiable prior consent of parents. The FTC amended its COPPA rule in 2013, clarifying that the regulations were applicable to mobile apps and web services and expanding the definition of personal data to include geolocation, device identifiers, and media containing the voice or image of a child. In 2016, the FTC more than doubled the maximum penalties that it can levy for violations of COPPA and began targeting advertising networks that knowingly maintain and disseminate data on underage users. In 2017, the FTC released updated guidelines on COPPA compliance to require that Internet-connected toys and other Internet of Things (IoT) devices, such as smart home devices, comply with the same regulations as online games and apps. In 2019, the FTC announced that it was initiating an early review of its COPPA rules (normally, rules are reviewed every 10 years) because of the rapid changes in technology. The review remains underway as of October 2022.

Since the law took effect, the FTC has obtained a number of settlements and fined a number of companies for violations of COPPA. For example, in 2019, the FTC fined Musical.ly, the original developer of the social network app TikTok, $5.7 million for unlawfully collecting personal information from children. According to the FTC, the company pursued growth at the expense of endangering children, allegedly receiving thousands of complaints from parents asserting that their child had created a TikTok account without their knowledge. Although the company closed the children's accounts in response, it did not delete the children's videos or profile information from its servers.

Individual states have also started enforcing COPPA regulations. New York and Texas

have targeted game developers for unlawful collection of children's information. New Mexico sued game developer Tiny Labs and several platforms that promoted its games, including Google and Twitter, for failing to require parental consent prior to collecting underage users' data in 91 different games clearly targeted at children.

Although COPPA technically can be enforced only by the FTC or states, some lawyers are bringing cases on the grounds of violation of common law privacy and statutory consumer protection legislation. For instance, in 2017, two plaintiffs brought class action lawsuits against Disney, Viacom, and Danish game maker Kiloo, as well as against several data collection firms, alleging that the companies had worked together to collect and disseminate children's personal information without parental consent. In 2021, the cases were finally settled, with Disney, Viacom, and 10 advertising technology firms agreeing to remove or disable ad tracking software in their apps that can be used to target children with ads.

The largest technology companies have also been fined and required to adjust their policies with regard to children signing up for their services. For instance, Google has come under scrutiny for failing to provide proper safeguards against the use of YouTube by users younger than 13 years of age and for allowing inappropriate videos even on its YouTube Kids platform, which was created specifically to curtail that type of content. In 2019, Google and YouTube entered into a record $170 million settlement with the FTC and the New York Attorney General, the largest fine under COPPA to date. The settlement requires YouTube, as well as individual content creators, to properly identify child-directed content. No personal data can be collected by such content, which limits creators' ability to use personalized behavioral advertising technology. Such content can no longer include a comments section, notifications functions, or a community tab. The settlement agreement makes clear that the FTC can penalize individual channel owners, making the consequences of failing to comply severe.

In 2022, President Biden called on Congress to strengthen privacy protections for children. A number of bills have been proposed that would amend COPPA to increase the age of children protected under the law and provide other protections, but prospects for passage of such bills remain uncertain.

In the meantime, the FTC has signaled that it will prioritize enforcement of COPPA's provisions, particularly in connection with educational technology software. In May 2022, the FTC warned such providers that data harvested by their applications should not be used for purposes unrelated to education and that it plans to aggressively enforce COPPA rules. In addition, the FTC issued requests for public comment on proposed amendments to its Endorsement Guides covering social media influencers. The proposed amendments include a section stating that endorsements directed at children by such influencers of are special concern.

SOURCES: "Mobile Apps: Google vs. Apple COPPA Risk Scorecard (Children's Privacy) Q2 2022," by Pixelate, September 2022; "FTC Warns EdTech Vendors about COPPA Compliance," by Christopher Savage, Dwt.com, June 2, 2022; "FTC Votes Unanimously to Release New COPPA Policy Statement and Proposed Amendments to Endorsement Guides," Wsgr.com, May 20, 2022; "President Biden Calls for Stronger Protections for Children in State of Union," Huntonprivacyblog.com, March 8, 2022; "Google's Children's Data Privacy Settlement Explained," by Kendra Clark, Thedrum.com, December 14, 2021; "Settlement Receives Final Approval in Disney/Viacom/Kiloo Child Privacy Violations Lawsuit," Lieffcabrasaer.com, April 13, 2021; "COPPA Killed the Video Star: How the YouTube Settlement Shows that COPPA Does More Harm than Good," by Stephen Beemsterboer, *Illinois Business Law Journal*, Volume 25, Summer 2020; "Summary of FTC COPPA Workshop—Key Issues and Takeaways," Jdsupra.com, October 23, 2019; "A Deeper Dive into the FTC's Record-Breaking Fine to Google and YouTube for Violating the COPPA Rule," by Ephraim Hintz and David Strauss, Lexblog.com, September 19, 2019; "FTC Seeks Comments on Children's Online Privacy Protection Act Rule," Ftc.gov, July 25, 2019; "Time Runs Out for TikTok App: Developer Musical.ly Agrees to FTC's Largest Fine for Children's Privacy Violations," by Alysa Zeltzer Hutnik and Lauren Myers, Adlawaccess.com, March 8, 2019.

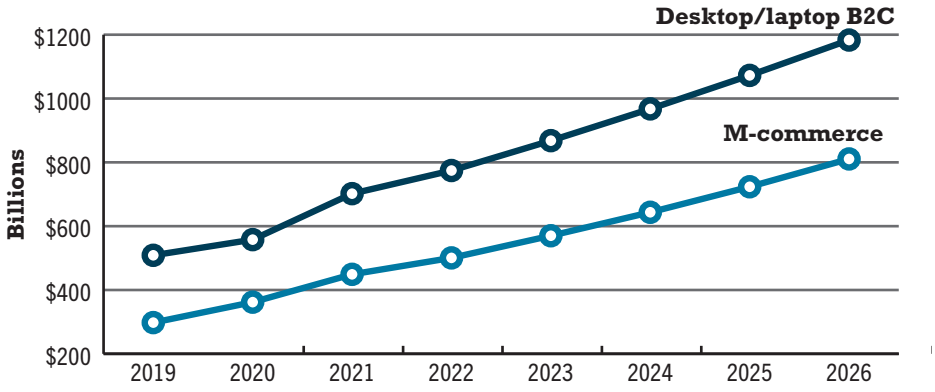
OVERVIEW: M-COMMERCE TODAY

It's a short number of steps from owning a smartphone or tablet to searching for products and services, browsing, and then purchasing. In the early years, retail m-commerce sales grew at a very rapid rate and then skyrocketed in 2020, growing by more than 45% in response to the Covid-19 pandemic. Although digital travel sales on all platforms, including mobile, were severely impacted by the Covid-19 pandemic, they too resumed growth in 2021. Analysts estimate that in 2022, m-commerce will account for about $500 billion in sales, constituting about 40% of all e-commerce revenues in the retail and travel industries. **Figure 7.5** illustrates the expected growth of mobile and "traditional" desktop/laptop e-commerce in the retail and travel industries by 2026.

Initially, m-commerce was focused primarily on digital goods such as music, videos, games, and e-books. Today, however, traditional retail products and travel services are the source of much of the growth in m-commerce. Not surprisingly, the m-commerce giant in the United States is Amazon. Amazon is by far and away the leading mobile retail app, with more than 110 million monthly unique users, reaching almost 50% of all U.S. adult smartphone users. Amazon's mobile app is the only retail e-commerce app in the top-10-most-used smartphone apps (Insider Intelligence/eMarketer, 2022k).

Increasingly, consumers are using their mobile devices to search for people, places, and things—like restaurants and deals on products they saw in a retail store. The rapid switch of consumers from desktop platforms to mobile devices is driving a surge in mobile marketing expenditures. Because search is so important for directing consumers to purchase situations, the mobile search advertising market is very important for search engines like Google. Desktop search revenues are slowing. Google's mobile ad business is growing rapidly, but the prices it can charge for mobile ads are far less than what it can charge for desktop computer ads. The challenge facing Google and other mobile marketing firms is how to get more consumers to click on mobile ads and how to charge marketers more for each click. And the answer lies with the consumer who decides what and when to click.

FIGURE 7.5 THE GROWTH OF M-COMMERCE



M-commerce in the retail and travel industries is expected to grow to about $810 billion by 2026.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022h, 2022i, 2022j.

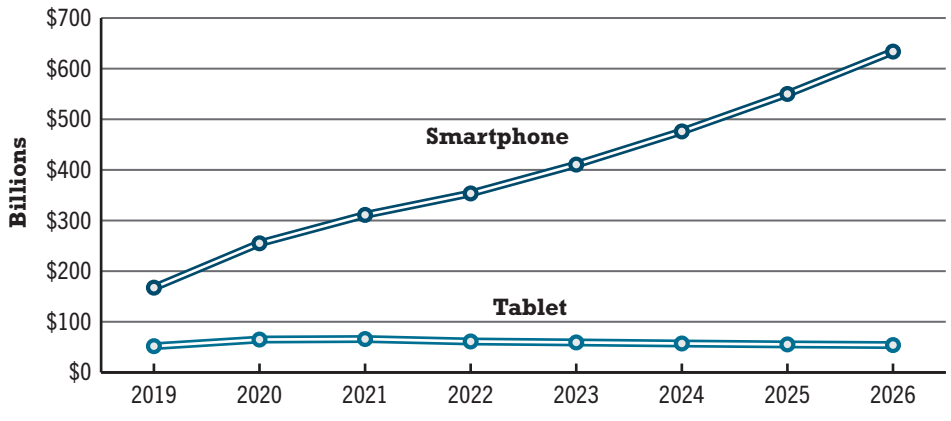
HOW PEOPLE ACTUALLY USE MOBILE DEVICES

If you plan a mobile marketing campaign, it's important to understand how people actually use their mobile devices (which may be different from what you do or from what you think others do). For instance, most of us think people use their mobile devices on the go, but according to one of the very few studies of actual mobile behavior, almost 70% of all mobile minutes actually take place in the home. In 2022, people are spending about eight and one-quarter hours with digital media on average daily, and about four and a half of these hours are spent using mobile devices—smartphones and tablets. What are they doing during that time?

Recent data shows that entertainment, not shopping or buying, is the primary focus (at least in terms of time) for mobile device users. Of the more than four and a half hours a day that people spend using their mobile devices, one hour and 20 minutes are spent listening to music and podcasts, about one hour and 10 minutes on social networks, almost one hour (54 minutes) on watching video, and about half an hour (27 minutes) using mobile game apps (Insider Intelligence/eMarketer, 2022l).

But although mobile devices are still primarily used for entertainment, socializing, and communicating, with less time spent using them for shopping or buying, this pattern is not necessarily permanent. M-commerce is surging. Initial expectations were that tablets would provide the primary m-commerce platform, but that has not proven to be the case. As the size of smartphone screens has grown and their resolution has improved, coupled with better mobile search, better location- and context-based discovery, and better mobile payment systems, the smartphone buying experience has improved, resulting in rapidly growing smartphone m-commerce sales (**Figure 7.6**).

FIGURE 7.6 **RETAIL M-COMMERCE SALES: SMARTPHONES VERSUS TABLETS**



Contrary to earlier expectations, retail m-commerce sales on smartphones are increasing at a much faster rate than those on tablet computers.

SOURCE: Based on data from Insider Intelligence/eMarketer, 2022m.

In-App Experiences and In-App Ads

You may think that using a browser to access the Web on your smartphone or tablet is a typical mobile activity. In reality, however, mobile users spend almost four times the amount of time (three hours and 22 minutes) using apps compared to the time spent using mobile browsers (52 minutes). Time spent on smartphones and smartphone apps, in particular, has been the biggest driver in the growth in digital media usage. Time spent on tablets and tablet apps has been relatively flat over the past five years, in contrast, as smartphone screens increase in both size and resolution. On average, users use about 45 apps a month on their smartphones. However, although there may be millions of apps on the iOS and Android platforms, only a small percentage are actually generating sufficient user traffic to be of interest to general advertisers. YouTube is the top smartphone app in the United States in terms of percentage of reach, followed by Facebook. Google has seven of the top 20 apps (YouTube, Gmail, Google Maps, Google Search, Google Play, Google Photos, and Google Drive), while Meta has three (Facebook, Messenger, and Instagram) (Insider Intelligence/eMarketer, 2022k, 2022n).

The implications for marketers are quite clear: If consumers are primarily using apps rather than browsing the Web on their mobile devices, marketers need to place ads in apps (where most of the action is for attracting consumers), and that means social network, game, and video apps. Second, if mobile consumers use, on average, only 45 apps, then marketers need to concentrate their marketing in these popular apps, let's say, the top 100. Niche marketers, on the other hand, can concentrate their ads in apps that support that niche. A distributor of diving equipment, for instance, could place ads in apps devoted to the diving community. There may not be many users of the app, but those who do use it are highly motivated on the topic.

Another implication for marketers is that rather than focus on mobile display ads that are difficult to read, the best ad may be an entertaining video ad that captures the viewer's attention or an ad in an app that is precisely targeted to the consumer's current activities and interests.

How the Multi-Screen Environment Changes the Marketing Funnel

Along with the growth of smartphones and tablets comes a multi-screen world: smartphones, tablets, desktops, and television. The reality, and the future, of computing devices is that consumers' lives will be multi-platform: using desktops and laptops at work and at home and using smartphones and tablets at home as well as when moving about. Television will be available all the time, both at home and on the go via smartphones and tablets. Consumer purchasing behavior changes in a multi-screen world. Consumers will often be using two or more screens at once, tweeting while watching a TV show or moving seamlessly from a TV ad to a mobile search for more information about the product or service featured in the ad. Several research studies have found that 90% of multi-device users switch among screens to complete tasks, for instance, viewing an ad on TV, searching on a smartphone for the product, and then purchasing the product on a desktop or laptop computer. Consumers move seamlessly among devices, either sequentially or simultaneously. Also, the more screens people use, the more shopping and purchasing they do. One conclusion is that the more screens consumers have, the more consumer touch points or marketing opportunities that exist (Google, Inc., 2012).

The implications of the multi-device platform, or screen diversity environment, are that marketing needs to be designed for whatever device the consumer is using and that consistent branding across platforms will be important. Screen diversity means that one ad size, for instance, will not fit all situations and that branding images will need to be adjusted automatically based on the device the consumer is using. From a design perspective, graphics and creative elements will appear differently depending on the screen. This is called responsive design or responsive creative design. Responsive design is a design process that allows your marketing content to resize, reformat, and reorganize itself so that it looks good on any screen. You can see responsive design in action if you look at any portal on a desktop and then compare the screen to that same portal viewed on a smartphone or tablet. You are likely to find that there are three versions of the screen, one for each platform. The requirement to find customers on multiple screens can add considerably to the cost of marketing online. Companies need to develop a presence and market not only on websites but also on mobile websites and/or on smartphone and tablet apps as well. Perhaps companies may not be able to afford all three of these and may want to choose only one. In that case, which is the best? Much depends on what the point of the marketing is. To drive sales, a website might be more effective, but to drive brand awareness and engagement, social and entertainment apps might be better.

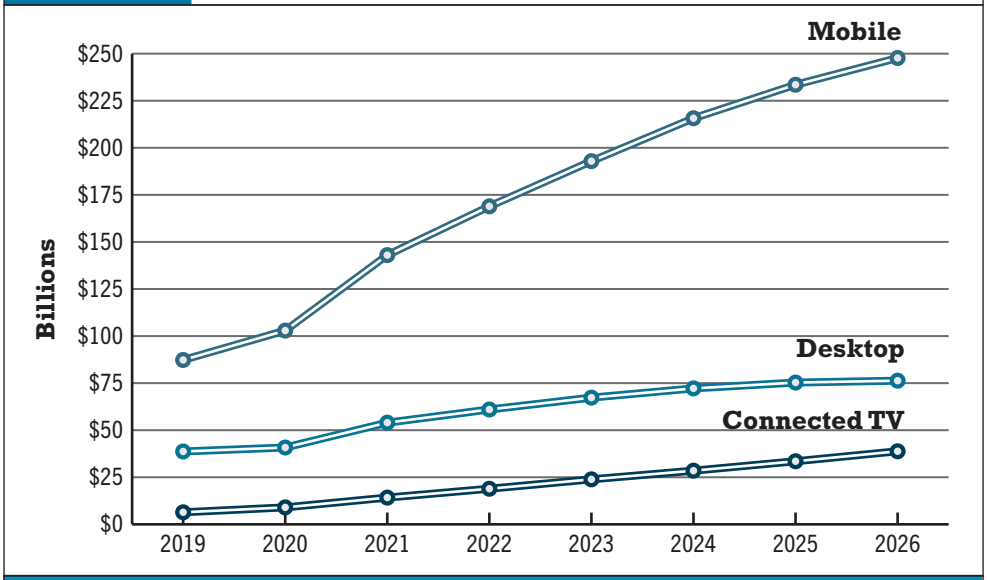
But even beyond screen adaptability, a multi-screen world means that merchants need to be on all platforms, and need to be integrated across platforms, in order to send a coherent message and to create a convenient consumer platform. The marketing environment today is much more complex than just placing banner ads on pages or on search engine results pages on the Web.

OVERVIEW: MOBILE MARKETING

As millions of consumers adopt mobile devices, mobile marketing expenditures have rapidly grown and in 2015, exceeded the amount spent on advertising on the desktop platform for the first time. This trend is expected to continue through 2026 (see **Figure 7.7**). In 2022, mobile marketing expenditures are expected to account for more than two-thirds of all spending on online marketing, which is extraordinary given that smartphones only first appeared in 2007 and that tablets didn't appear until 2010. Analysts believe that if current mobile marketing growth rates continue, by 2026, spending on mobile marketing will account for almost 70% of all online advertising and will be more than three times as much as what is spent on desktop advertising.

Mobile advertising is dominated by Meta (Facebook/Instagram) and Google (including YouTube). Meta surpassed Google in mobile advertising revenue for the first time in 2018. In 2021, Meta generated almost $50 billion in mobile ad revenues, one-third of the entire market. Google/YouTube was second, with mobile advertising revenues of about $38 billion. Other major players in the mobile marketing marketplace include Amazon, with about an 8% share; Twitter, with about a 1.6% share; LinkedIn (1.4%); and Snapchat (1.4%) (see **Figure 7.8**). On the mobile platform, Google is the king of search, generating $32 billion from mobile search ads in 2021, more than 60% of all mobile search ad revenues. Just as Google dominates in mobile search ads, Meta dominates in mobile display ads, including video advertising spending (Insider Intelligence/eMarketer, 2022o, 2022p, 2022q, 2022r).

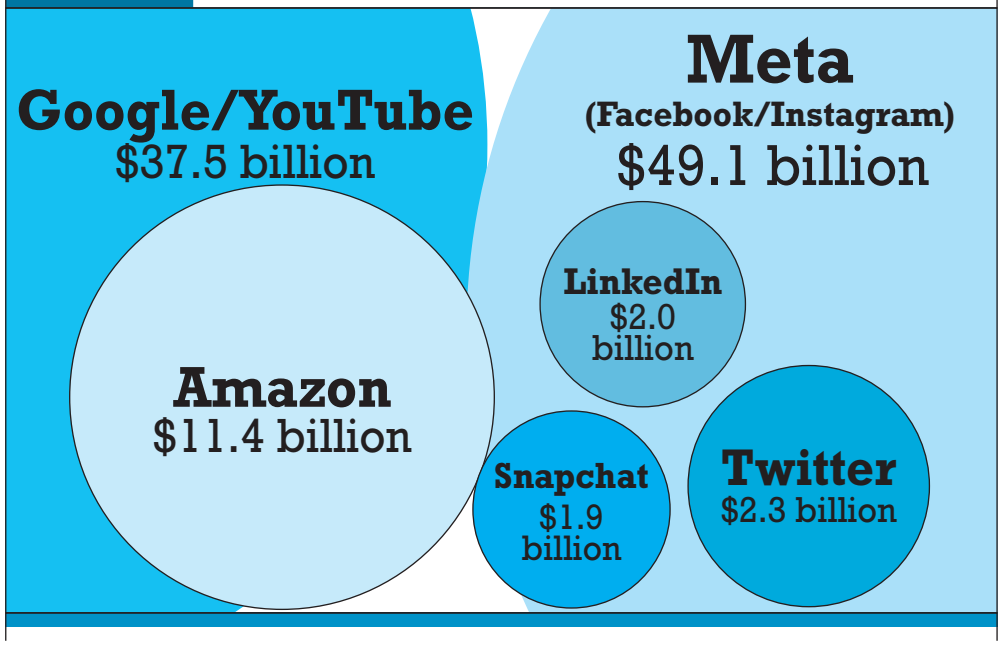
FIGURE 7.7 MOBILE VERSUS DESKTOP MARKETING EXPENDITURES



Spending on mobile marketing is growing much more rapidly than spending on advertising aimed at desktop computers. By 2026, it is anticipated that advertisers will be spending more than three times as much on mobile marketing than on desktop marketing. Spending on advertising on connected TVs is also growing and is expected to more than double between 2022 and 2026.

SOURCE: Based on data from Insider Intelligence/eMarketer, 2022a.

FIGURE 7.8 THE TOP U.S. MOBILE MARKETING FIRMS BY U.S. REVENUE



Mobile advertising is dominated by Meta and Google.

SOURCE: Based on data from Insider Intelligence/eMarketer, 2022p.

THE TECHNOLOGY: BASIC MOBILE DEVICE FEATURES

Everybody knows the capabilities of smartphones and tablets. But what is it about mobile platforms that makes them different from desktops? What features make them especially suitable for marketing?

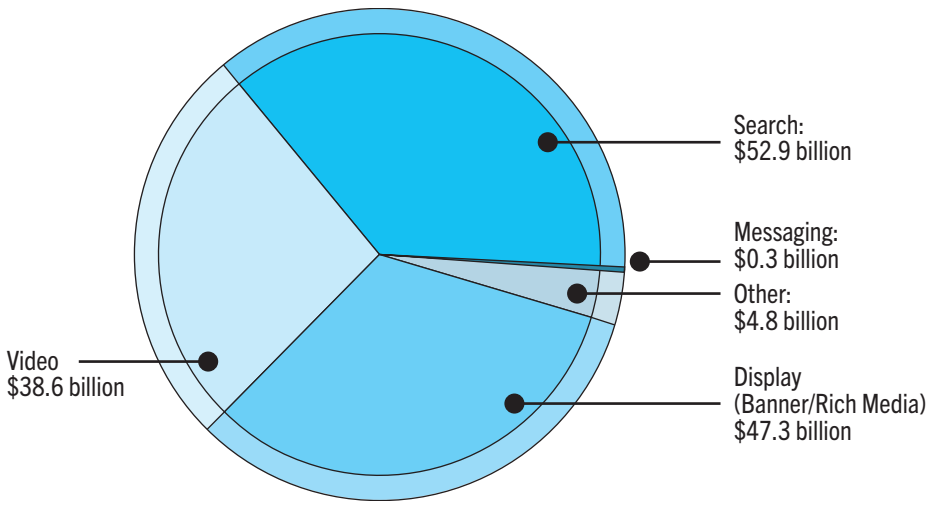
For starters, smartphones today play a much more central role in the personal lives of consumers than desktops and laptops in large part because smartphones are always physically with us, or close by. In this sense, they are more personal, and almost "wearable." The "always on, always with us" nature of smartphones has several implications for marketers. First, because smartphones are perceived as "personal appendages," consumers are less tolerant of commercial intrusion. Have you ever had a telephone conversation interrupted by an advertisement? You probably have not, but if you were, you most likely would be annoyed at the interference during a personal conversation. These attitudes extend to any use of the phone or tablet, from reading e-mail, visiting Facebook, or watching a video. Consumers are simply less tolerant of advertising on the small screens of smartphones. Second, the around-the-clock, physical proximity of smartphones to our persons greatly expands the time available for marketing materials and increases the supply of screens for marketing materials. This excess supply decreases the price of mobile marketing messages. In turn, there is a tension between marketers and consumers: Marketers want to increase the number of mobile ads, whereas consumers want to see fewer ads, not more, on their mobile devices. Ads inside apps are treated differently by consumers: In return for a free app, consumers are more accepting of ads.

But perhaps the most unique feature of smartphones is that they know users' precise location by virtue of their built-in GPS (Global Positioning System). This allows marketing messages to be targeted to consumers on the basis of their location and supports the introduction of location-based marketing and local marketing (described in Section 7.4). Although websites may know a desktop's general location, it is a very imprecise fix, and the position of the desktop does not change as the user moves about. **Table 7.12** summarizes the features of mobile devices that marketers can leverage.

TABLE 7.12 FEATURES OF MOBILE DEVICES

FEATURE	DESCRIPTION
Personal communicator and organizer	Telephone plus calendars and clocks to coordinate life on a personal scale.
Screen size and resolution	Resolution of both tablets and phones is high enough to support vibrant graphics and video.
GPS location	Self-locating GPS capability.
Web browser	Standard browsers will operate all websites and applications.
Apps	Millions of specialized applications extending the functionality of mobile devices.
Ultraportable and personal	Fits into a pocket, or a briefcase for tablets, and thus able to be used anywhere and on the go.
Multimedia capable: video, audio, text	Fully capable of displaying all common media from video to text and sound.
Touch/haptic technology	Enhances touch screens by providing feedback in the form of vibration, force, or motion.

FIGURE 7.9 U.S. MOBILE AD SPENDING BY FORMAT



Search engine advertising is still the most popular mobile marketing format.
SOURCE: Based on data from Insider Intelligence/eMarketer, 2022s.

MOBILE MARKETING TOOLS: AD FORMATS

Unlike social marketing, mobile marketing does not require much of a new marketing vocabulary. All the marketing formats available on the desktop are also available on mobile devices. With few exceptions, mobile marketing is very much like desktop marketing—except that mobile marketing screens are smaller. The major marketing opportunities in mobile marketing are search ads, display ads (banners, rich media, and sponsorships), messaging (SMS/MMS/PPS), and some other familiar formats like e-mail, classifieds, and lead generation. **Figure 7.9** illustrates the relative size of mobile marketing expenditures by format.

Search engine advertising continues to be the most popular mobile marketing format, accounting for 37% of all mobile ad spending in 2021. Search engine ads can be further optimized for the mobile platform by showing ads based on the physical location of the user. Display ads (banner ads, rich media, and sponsorships) are the second leading ad format, accounting for about 33% of mobile ad spending. Display ads can be served as a part of a mobile website or inside apps and games. Ad networks such as Google's AdMob, Meta Audience Network, MoPub, and inMobi are some of the largest providers of mobile display advertising. Video advertising accounted for about 27% of mobile marketing spending and is the fastest-growing segment. Most desktop video ads can be resized for use on mobile phones and tablets. Mobile messaging generally involves SMS text messaging to consumers, with coupons or flash marketing messages. Messaging can be effective for local advertising because consumers can be sent messages and coupons as they pass by or visit locations (see Section 7.4).

TABLE 7.13 SELECTED MOBILE MARKETING CAMPAIGNS

COMPANY	CAMPAIGN
McCormick & Company	To increase awareness for its French's Classic Yellow Mustard, developed a video that gave smartphone users a high-quality viewing experience coupled with an interactive game to encourage extra engagement. The campaign surpassed multiple benchmarks and was nominated for a number of mobile marketing awards.
Dior Beauty	To promote a new lipstick brand, launched a campaign featuring brand ambassador Jisoo, a member of the K-Pop group Blackpink, that offered Jisoo's Instagram followers access to four days of content and conversation via mobile messaging platform WhatsApp.
Domino's Pizza	Used the Storyly platform to design interactive in-app marketing campaigns in the form of videos and polls to engage users and encourage them to interact with designated calls-to action (CTAs). Achieved an overall 64% higher conversion rate compared to static banners and visits to the campaign page on the app rose by 37%.
Proozy	Minnesota-based retailer of deep-discount sports apparel and athletic gear used Klaviyo SMS messaging platform to create personalized customer SMS messages. Messages were optimized for better performance, with an average order value of $74 from new subscribers who made a purchase.

Social networks such as Facebook, Instagram, TikTok, Twitter, and Pinterest have generally brought desktop advertising techniques to the mobile platform, with some alterations of the interface for use on small-screen smartphones. In the process, social networks have brought real innovation to the mobile marketing experience, including Feed posts on Facebook and Promoted Ads and Follower Ads in Twitter. **Table 7.13** provides selected examples of mobile marketing campaigns and techniques used by several well-known firms.

Mobile marketing is uniquely suited for branding purposes, raising awareness through the use of innovative technologies such as 3D and augmented and virtual reality. Read the *Insight on Business* case, *Mobile Marketing Revs Up with 3D, AR, VR, and the Metaverse*, for a further look.

STARTING A MOBILE MARKETING CAMPAIGN

As with all marketing campaigns, start by identifying your objectives and understanding just how a mobile marketing campaign might help your firm. Are you a new, unknown startup seeking to develop a brand image, or are you an already-existing brand looking to strengthen your presence and sell products? Is there something about your products that makes them especially attractive to a mobile audience? For instance, if you sell to local customers walking by your shop, then you might want to use the GPS capabilities of smartphones to target consumers who are nearby.

Next, consider the target demographic for your campaign and products. The most active purchasers on mobile devices are men, and they are more likely than women to buy consumer electronics equipment and digital content. Women are more likely than

INSIGHT ON BUSINESS

MOBILE MARKETING REVS UP WITH 3D, AR, VR, AND THE METAVERSE

The mobile platform is the dominant marketing platform today, driven by the advent of smartphones. The use of mobile devices to purchase products or services online (as opposed to just shopping and browsing online) has grown significantly, and local businesses are taking advantage of the passive GPS capability of smartphones to create location-based marketing for potential customers who are physically close by. But mobile marketing is also good for introducing new products and building brand recognition, with sales taking place elsewhere and offline. Newer advertising formats such as 3D ads, augmented reality (AR) ads, virtual reality (VR) ads, and the metaverse are redefining advertising in the smartphone era.

3D advertising, which uses video and other interactive features that take advantage of the capabilities of modern mobile devices, is one increasingly popular method of advertising for companies that have a big advertising budget. Honda's campaign for its Odyssey minivan, created in partnership with mobile advertising firm Amobee, is a good example of 3D advertising in action. Honda's goal was to simulate the experience of seeing the car in person using a three-dimensional, virtual showroom. The ad can be accessed in either 3D or VR formats. The 3D ad allows viewers to rotate the image of the vehicle using the touch screen, pick among a variety of colors, and view additional information about each vehicle by selecting on-screen icons. The VR ad allows consumers to view a virtual representation of the vehicle, simulating its actual appearance. Because these types of ads use many innate features of smartphones, they actually take up less bandwidth than similar HTML5 rich media ads. In this case, Honda saw an 84% increase in overall ad engagement rate.

AR advertising is another quickly growing field that has mobile advertisers excited. If you use Snapchat, chances are good that you've seen the Dancing Hot Dog, which has been viewed more than 2 billion times by Snapchat users. The famous frankfurter is the first and most prominent example of what Snapchat calls a 3D World Lens, or an image overlaid on your phone screen that uses the phone's camera. The virtual objects are nonetheless fully three-dimensional, meaning that you can walk around them and view them from any angle. Advertisers are understandably excited about the possibility of using this format to bring their products or characters to life in Snapchat users' real-world environments in a way that doesn't feel like advertising.

BMW created an AR version of its X2 vehicle for Snapchat users, allowing them to walk around the car and see it in perfect detail. Hundreds of companies have run World Lens advertisements to date, including Nike, Foot Locker, Hershey's, and Budweiser, which released a Lens during the Super Bowl consisting of its iconic Clydesdale horse kicking a football. Snapchat also offers software called Lens Studio, which allows companies to create their own Lenses without Snapchat's involvement. More than 250,000 creators have developed 2.5 million Lenses. In 2021, Snap launched Arcadia, a studio to help brands create AR advertising experiences, not just on Snapchat but also on other social media platforms and websites. P&G Beauty, Verizon Communications, and entertainment company WWE are among Arcadia's first clients. In May 2021, Snapchat introduced AR-based shopping lenses, and since that time, major retailers such as Walmart

and Ikea have used the technology, and more than 250 million users have used such lenses more than 5 billion times. Snapchat continues to release new AR tools for virtual shopping.

Not to be outdone, Facebook entered the fray in 2018 with its own offering, Facebook AR Studio (now called Meta Spark Studio). Brands can add augmented reality camera effects to mobile ads on the Facebook Feed, Instagram Feed, and Instagram Stories to create immersive experiences and encourage users to Interact with their brand and virtually try out products. According to Facebook, a meta-analysis of 10 ad campaigns that incorporated AR ads found that those campaigns nearly tripled the boost In brand lift compared to "business-as-usual" campaigns. The campaigns that incorporated AR effects also had an almost 60% lower cost In driving awareness.

These types of ads are currently available mostly to bigger brands because of the ads' prohibitive cost, which can reach into the hundreds of thousands of dollars for a month-long campaign. Mobile AR advertising revenue is expected to be almost $7 billion by 2025. Retail brands with physical products are great fits for 3D and AR ads, whereas companies offering services, such as financial institutions, may never be interested. Currently, these ads offer excellent engagement rates, but some of that may be because of novelty; when these ads become more commonplace, they may also be slightly less effective. Still, the trend toward 3D and AR advertising is undeniable. One industry survey showed that most consumers already say that AR is changing how and where they shop and that AR advertising makes shopping more fun. The advertising industry may be in the midst of a paradigm shift. 3D and AR advertising have the potential to leave traditional advertising behind, the way mobile devices have left the desktop behind.

The next frontier in mobile marketing may be the extension of 3D, AR, and VR technologies into a new virtual environment known as the metaverse. Snapchat's new AR feature, "Custom Landmarkers," allows users and marketers to create AR visuals that are tied to specific locations, giving a glimpse of the mobile future of the metaverse. In August 2022, HBO Max partnered with Snapchat to use Custom Landmarkers in connection with the launch of its new *House of Dragons* series. The gaming platform Roblox, available on a variety of mobile devices, has emerged as a key player in many brands' metaverse strategies. For example, in September 2022, Walmart launched two immersive experiences, Walmart Land and Walmart's Universe of Play, on the Roblox platform. Walmart Land, aimed at an older demographic, includes the House of Style, which focuses on the marketing of fashion and beauty products. Walmart's Universe of Play provides a showcase of the year's best toys, just in time, as noted in Walmart's press release, for those "oh-so-real" holiday wish lists. Although it is too early to tell whether the metaverse will have a transformative effect on mobile marketing, many major companies are betting that it will.

SOURCES: "Walmart Jumps Into Roblox with Walmart Land and Walmart's Universe of Play," Corporate.walmart.com, September 26, 2022; "Snap, HBO Max Use Location-Based Augmented Reality for Fiery Dragons," by Jeremy Goldman, Insider Intelligence/eMarketer, August 22, 2022; "Groundbreaking AR Ad Study Quantifies the Value of Immersive Creative," Facebook.com, June 15, 2022; "Twitter, Meta Increase 3D Advertising as Stepping Stone to the Metaverse," by Jeremy Goldman, Insider Intelligence/eMarketer, April 6, 2022; "Snapchat Aims at the Metaverse with New AR Product," by Daniel Konstantinovic, Insider Intelligence/eMarketer, March 18, 2022; "Snapchat Uses AR Technology to Create Virtual Holiday Stores for Brands," by Erika Wheless, Adage.com, November 23, 2021; "Snap Launches Studio to Create Augmented Reality Ads," by Sheila Dang, Reuters.com, October 19, 2021; "Snap Partner Summit/The Future of Lenses," Snap.com, April 4, 2020; "Snapchat's Betting Its Future on Augmented Reality Ads—Here Are All the Different Types," by Tanya Dua, Businessinsider.com, April 27, 2018; "Snapchat's Lens Studio App Opens Augmented-Reality Format to Everyone, Including Self-Serve Advertisers," by Tim Peterson, Marketingland.com, December 14, 2017; "BMW Test Drives Snapchat Lenses in First 3D Car Ad," by Garett Sloane, Adage.com, November 22, 2017; "Honda and RPA Drive Innovation with First to Market Opportunity, Creating Industry-First Shareable and Scalable Virtual Reality Campaign," Amobee.com, accessed 2018; "Snapchat's World Lenses Are Just the Tip of the AR Advertising Iceberg," by Tommy Palladino, Next.reality.news, September 29, 2017; "Sponsored Snapchat World Lenses Bring Brand Characters to Augmented Reality," by Hillary Grigonis, Digitaltrends.com, September 29, 2017; "What Snapchat's Dancing Hot Dog Means for the Future of AR," by Garett Sloane, Adage.com, July 24, 2017.

men to cash in coupons and respond to flash sales and deals. Younger consumers are more likely than older consumers to research products and prices on mobile devices and are more likely to share their experiences using social media. Mobile shoppers and buyers are more affluent than the online population in general. These demographics are averages, and mobile marketing campaigns do not need to restrict themselves to these averages. Find out where your mobile customers are congregating. Are your mobile customers likely to be using apps, and if so, which apps? Are your customers likely to be on Facebook or use Twitter? Or are your customers most likely to find you on a Google mobile search page?

Finally, consider the marketspace where you hope to succeed. What are your competitors doing on the mobile platform? Is their presence effective? Where do they place their marketing efforts: display ads on websites or display ads in Google search results? Or can they be found as in-app ads? What apps are they advertising in? How are they represented on Facebook Mobile? Do they also have a Twitter and/or Pinterest brand page? Do your competitors have an app that users can easily download? You'll want to be able to meet your competitors on each of the platforms they have adopted. After you've developed an initial vision for your marketing campaign, you can develop a timeline and an action plan of how to meet the milestones identified in your timeline.

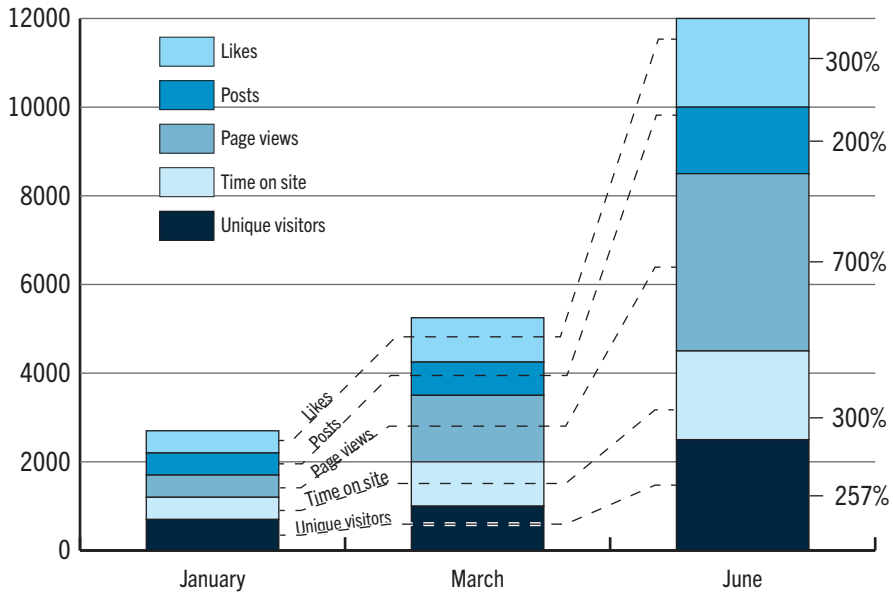
After you have envisioned your marketing campaign and identified your market, it is time to start implementing your mobile campaign. Here are some steps to follow:

- Develop a mobile website so that mobile consumers can see and buy your products. Make your mobile website social by including links to Facebook, Instagram, TikTok, Twitter, Pinterest, and other social networks.
- If you already use a display advertising program like Google's AdWords or a Meta Business Suite account, create a new campaign using the same ads but designed specifically for mobile platforms.
- Consider opening a Google AdMob account, in part because ad networks can publish and track your ads on multiple platforms simultaneously.
- Develop marketing content that is aimed specifically at the mobile user, with videos and high levels of interactivity that are designed for the mobile screen.
- Measure and manage your campaign. Google's AdWords, along with many other ad networks, will host and manage your mobile campaign. In addition, these ad networks can provide you with a host of campaign measures that will allow you to see which mobile ads and techniques are attracting the most followers, comments, and social activity concerning your brand. With this basic data you can start to manage the mobile marketing campaign by reducing expenditures on ads that do not work and increasing the budget of ads that do work.

MOBILE MARKETING ANALYTICS

There are many different mobile marketing objectives and, therefore, many different types of mobile marketing campaigns. Some campaigns are sales-oriented, are based on display and search ads, offer coupons or discounts, and take users directly to a website where they can buy something. Measuring the results of these mobile campaigns is similar to measuring the results of campaigns launched on desktops.

FIGURE 7.10 MEASURING THE EFFECTIVENESS OF A MOBILE AND SOCIAL MARKETING BRANDING CAMPAIGN



The effectiveness of a branding campaign utilizing the mobile platform and social marketing can be measured by examining the number of Likes, posts, page views, time on site, and unique visitors.

Other campaigns focus on branding, where the objectives are to engage consumers in a conversation, to acquire them as fans, and to have them spread the word among their friends. You can use the framework shown in Figure 7.4 to measure the results of these campaigns. The key dimensions to measure for mobile social campaigns are fan acquisition, fan engagement, amplification, community, brand strength (center of conversation), and sales.

Figure 7.10 illustrates how a brand-oriented marketing campaign utilizing the mobile platform and social marketing might present its effectiveness measures over a six-month period. In a branding campaign, the object is not as much sales as it is strengthening consumers' engagement with the brand. In the example provided in Figure 7.10, acquiring fans is measured by the number of unique visitors. Here you can see that over six months, the number of visitors has more than doubled. Engagement is reflected in the time on site (in minutes); amplification is measured by the number of Likes, and this has expanded threefold. Community is measured by the number of posts; a large number of posts suggests that fans are actively engaging with one another and the brand. Posts have also doubled in the period. Brand strength is best summarized in this figure as the composite picture of fan acquisition, fan engagement, amplification, and community measures. Measuring the impacts of this mobile campaign on ultimate sales requires going a step further and measuring which sales can be attributed to this mobile campaign.

7.4 LOCAL AND LOCATION-BASED MOBILE MARKETING

location-based marketing targets marketing messages to users based on their location

location-based services involve providing services to users based on their location

Location-based marketing is one of the fastest-growing segments of the digital marketing universe. **Location-based marketing** targets marketing messages to users based on users' location. Generally, location-based marketing involves the marketing of location-based services. **Location-based services** involve providing services to users based on users' location. Examples of location-based services are: personal navigation (How do I get there?), point-of-interest (What's that?), reviews (What's the best restaurant in the neighborhood?), friend-finder (Where are you? Where's the crowd?), and family-tracker services (Where is my child?). There is a connection, of course: the more people use their mobile devices to search for and obtain local services, the more opportunities there are for marketers to target consumers with messages at just the right moment, at just the right location, and in just the right way—not pushy and annoying but in a way that improves the consumer experience at the moment of local shopping and buying. This kind of marketing is the ideal in any event. Location-based marketing can take place on a desktop as well because browsers and marketers know your approximate location. But in this section, we focus primarily on location-based mobile marketing, which is where the greatest growth and opportunities lie.

Experience and market research suggest that consumers want local ads, offers, information, and content. Consumers have a high likelihood of acting on local ads and purchasing the products and services offered. Because it has evolved so rapidly in the last five years, experience and research with respect to location-based marketing are a work in progress, with many different platforms, providers, and techniques. Measures of effectiveness and returns on investment are still being developed.

THE GROWTH OF LOCAL MARKETING

Prior to the release of Google Maps in 2005, nearly all local advertising was nondigital and provided by local newspapers, local radio and television stations, local Yellow Pages, and billboards. Of course, some advertising was digital and involved the websites of local merchants. In 2022, total media ad spending in the United States is expected to be about $346 billion, and approximately $167 billion of this is local media ad spending by both national and local brands. An estimated 40% of this local advertising involves truly local firms like restaurants, grocery stores, theaters, and shoe stores marketing to their local audience. The remaining 60% of local media marketing involves large national firms marketing to local audiences, such as an ad for Coca-Cola in a local newspaper or websites created by national firms for local auto dealers. Of the $167 billion of local media spending, about 47% ($79 billion) will be spent on online marketing (Insider Intelligence/eMarketer, 2022t; BIA Advisory Services, 2022).

After the introduction of Google Maps, online local marketing began to rapidly expand. Google Maps on desktop computers enabled the targeting of ads to users based on a general sense of their IP address and enabled merchants to display ads to users based on the general location of potential customers, usually within a several-square-mile radius. IP addresses can be used to identify a city—and a neighborhood within the city—but not a zip code, street, or building. Google Maps helped users answer the question "Where can I find an Italian restaurant" in a city or a section of a city from their desktop.

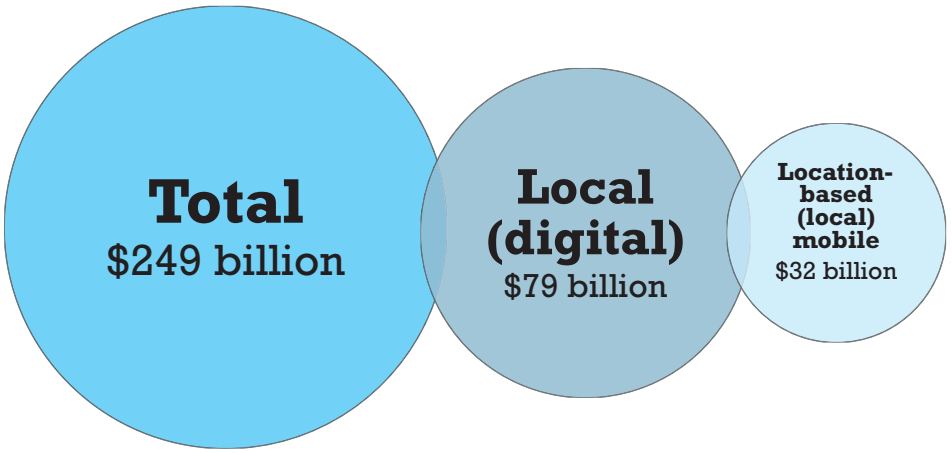
The arrival of smartphones in 2007, and of Google's Maps mobile app, took this one step further. The GPS receivers in second-generation smartphones introduced in 2008, along with other techniques, meant that a user's location (latitude and longitude) could be identified by cellphone manufacturers, marketers, service providers, and carriers like AT&T and Verizon. These developments opened up an entirely new growth path for local online advertising that heretofore had been confined to the desktop. In this new world, a local food market could advertise to mobile phone users as they walked by the store and offer discounts to responders, and users in turn could search for specific retail stores nearby, even checking the stores' inventory before walking into a specific store.

THE GROWTH OF LOCATION-BASED (LOCAL) MOBILE MARKETING

Location-based (local) mobile marketing is currently a small part of the online marketing environment, but it is expected to continue to increase in importance over the next five years. **Figure 7.11** helps put the location-based mobile market in perspective. In 2022, total online marketing is expected to be almost $250 billion, and local online marketing is expected to be a surprisingly large $79 billion. The part of local online marketing that is location-based mobile marketing is expected to generate an estimated $32 billion.

The ad formats used in local mobile marketing are familiar—search ads, display ads, native/social ads, videos, and SMS text messages. Search ads displayed as a part of user search results comprise the largest location-based mobile ad format. The local mobile search market is dominated by Google. Native/social ads are the second-largest format. Display ads are the third-largest format. Here the main players are Meta and Google. Together, Google and Meta account for the vast majority of location-based mobile marketing.

FIGURE 7.11 LOCATION-BASED MOBILE MARKETING IN PERSPECTIVE



Local online marketing will account for about $79 billion in marketing expenditures in 2022, with location-based mobile marketing expected to account for about $32 billion of that amount.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022a; BIA Advisory Services, 2022.

LOCATION-BASED MARKETING PLATFORMS

The key players in location-based mobile marketing are the same giants that dominate the mobile marketing environment described previously, namely, Google, Meta, Twitter, and YP (formerly Yellow Pages). Google is clearly the leading location-based marketer largely because of its widely used Google Maps app (as well as the Waze app, which Google acquired in 2013) on smartphones. When a consumer searches for a location on Google Maps or Waze, it is an ideal marketing moment to deliver an ad to that consumer. Google My Business is a simple but effective service that provides short business profiles when users search for a specific business. Google's Android operating system has location functionality built into it, and Google apps, like Google Maps and Waze, continuously update the user's location. Google claims to be the world's largest mobile advertising firm for both Android and Apple's iOS operating systems. App developers use AdMob, a mobile advertising business acquired by Google in 2009, to provide their apps with consumer and user location information. Google also sells location information to independent marketing firms. Marketing firms use AdMob to develop full-screen, rich media ads. Google's main revenue stream comes from its AdWords service, where marketers bid for keywords on Google's search engine. AdWords used to be the same whether displayed on a desktop computer or on a mobile device, but Google has upgraded its AdWords service to optimize ads for user contexts and devices and to provide management of campaigns across all mobile and desktop devices. For instance, if customers search for "pizza" on a desktop computer from work at 1 p.m., they would be shown nearby restaurants and an order form. If customers searched for "pizza" at 8 p.m. on a smartphone within a half-mile of a pizza restaurant, they might be shown a click-to-call phone number and directions to the restaurant. Pizza restaurants pay Google for the chance to show up in these searches.

Google has an advantage in the location-based market: It has developed extensive maps of Wi-Fi networks throughout the world, allowing Google to develop much more precise location information than competitors can.

LOCATION-BASED MOBILE MARKETING: THE TECHNOLOGIES

geo-aware
techniques that identify the location of a user's device and then target marketing to the device

proximity marketing
techniques that identify a perimeter around a physical location and then target ads to users within that perimeter, recommending actions that are possible within the fenced-in area

Location-based services and marketing require marketers and local service providers to have a fairly precise idea of where consumer mobile devices are located. There are two general types of location-based marketing techniques: geo-aware and proximity marketing. **Geo-aware** techniques identify the location of a user's device and then target marketing to the device, recommending actions within reach (which, in itself, requires the marketer to know where relevant things like stores are located). For instance, a marketer may target smartphones within several square city blocks to alert the smartphone users to available offers from participating merchants. **Proximity marketing** techniques identify a perimeter around a physical location and then target ads to users within that perimeter, recommending actions that are possible within the fenced-in area (geo-fencing). The perimeter can be from hundreds of feet (in urban areas) to several miles (in suburban locations). For instance, if users walk into the geo-fenced perimeter of a store, restaurant, or retail shop, they will receive ads from these businesses. Both of these techniques utilize the same locating technologies.

TABLE 7.14 MAJOR LOCATING TECHNOLOGIES

TECHNOLOGY	DESCRIPTION
GPS	The user's device downloads GPS data from a GPS satellite. First introduced with the Apple 3G iPhone in 2008. Today, cellphones are required to broadcast their GPS location for emergency assistance purposes.
Wi-Fi	Estimates user's location within a radius of a known Wi-Fi access point.
Bluetooth low energy (BLE)	Used by Apple in iBeacon. Uses less battery power than traditional Bluetooth or GPS and is more accurate than targeting via Wi-Fi triangulation.
Geo-search	Uses location information based on the user's search queries.
Cell tower	AT&T, Verizon, and other carriers are in constant contact with their devices, which allows approximation of location by triangulation and refinement of the unit's GPS location. Wireless carriers use a cellphone's MAC address to identify the phone and its location.
Sign in/registration	Estimates users' location when they self-identify their location using sign-in services or social network posts.

Ad networks, local-mobile marketing firms, providers of devices and services like Google and Apple, as well as phone companies use several methods for locating mobile devices, none of which is perfect and all of which have varying degrees of accuracy. **Table 7.14** describes the major locating technologies that are used to enable location-based services and marketing.

GPS (Global Positioning System) location is the most accurate positioning method, in theory. In practice, the signal can be weak in urban areas, nonexistent inside buildings, and deflected; and it can take a long time (30–60 seconds) for a device to locate the signal and calculate a position. When a clear signal is obtained, GPS can be accurate to within 3–10 meters under ideal conditions, but more frequently, a cellphone's GPS is accurate only to within 50 meters—half a football field. Also, users have to activate the feature, and many users do not, for privacy reasons. Assisted GPS (A-GPS) supplements GPS information with other information from the phone network to speed up signal acquisition. Nearly all smartphones use A-GPS. In Apple's iOS, users can decide whether to turn Location Services on or off. When turned on, the iOS uses GPS, cellular, and Wi-Fi networks to determine the user's approximate location to within 10 meters (30 feet), although in many situations, accuracy can be much higher, around 15 feet. The user's iPhone continuously reports its position to Apple servers.

Cell tower location is used by wireless telephone carriers to track the location of their devices, which is required to complete phone calls as devices pass from the range of one tower into the range of another. Cell tower location is also the basis of the wireless emergency response system in the United States. In order to assist emergency responders in locating users who make 911 calls, the FCC's wireless Enhanced 9-1-1 (E9-1-1) rules require wireless carriers to track cellphone locations whether or not the user has turned on location services.

Wi-Fi location is used in conjunction with GPS signals to more accurately locate a user based on the known location of Wi-Fi transmitters, which are fairly ubiquitous in urban and suburban locations. Apple, Google, and other mobile service providers have developed global databases of wireless access points simply by driving cars around urban areas in much of the world. Google uses Street View cars to develop a global database of wireless access points and their geographic locations. Android applications can use this database to determine the approximate location of individuals based on the Wi-Fi networks detected by their mobile devices. All Wi-Fi devices continuously monitor the presence of local Wi-Fi networks, and mobile devices report this data back to Apple and Microsoft, along with other device manufacturers, who use similar methods. The goal of these technologies is to provide consumers and marketers with "micro-location data" that is accurate to within a few feet in order to support truly real-time, accurate, local marketing at the personal level. For instance, if you are looking at a rack of dress shirts in a retail store, an accurate positioning system could detect this activity and direct you to appropriate accessories like socks and ties on surrounding shelves.

WHY IS LOCATION-BASED MOBILE MARKETING ATTRACTIVE TO MARKETERS?

Consumers who seek information about local businesses using mobile devices are much more active and ready to purchase than are desktop users. In part this is because desktop searchers for local information are not in as close proximity to merchants as are mobile searchers. A Google survey found that more than 80% of U.S. consumers use smartphones and tablet computers to conduct local searches on search engines for a variety of local information such as business hours, local store addresses and directions, and availability of products at local stores. The survey found that consumers search for local information all the way through to the purchase process, that 50% of smartphone users visited a store within a day of their local search, and that 18% made a purchase within a day (Google, 2014). Marketers are increasing their use of location data in order to be able to better target their ads and to enhance audience engagement, customer experience, and audience segmentation.

However, location-based marketing is facing some significant challenges entering the new decade because of privacy concerns and new laws and regulations such as the California Consumer Privacy Act (CCPA) and the California Privacy Rights Act (CPRA). Consumers have become more aware of location-based advertising, and although surveys indicate that consumers appreciate the usefulness of such advertising, many consumers find it "creepy." Operating system updates by Apple, such as its App Tracking Transparency (ATT) program and its App Privacy Reports, and Google have added more user controls, restricting the collection of location data by apps and making data that is available more costly. Marketers are going to have to adjust to the new environment by reducing their reliance on third-party data and being more transparent about their collection methods and uses. We discuss privacy issues related to location-based marketing in more detail in Chapter 8 (Insider Intelligence/eMarketer, 2022u).

LOCATION-BASED MARKETING TOOLS

Location-based digital marketing, like social marketing, presents students of digital marketing with a confusing array of services, platforms, and firms that provide these services. Although some local-based marketing techniques, like placing ads

on Google's AdSense platform, are relatively easy to implement for a small business owner, employing other techniques requires the help of mobile marketing provider firms.

Location-Based Digital Marketing Features

Location-based services involve providing services to users based on their location. Examples include personal navigation, point-of-interest, reviews, friend-finder, and family-tracker services. **Table 7.15** describes how some of these features can be used for marketing.

TABLE 7.15 LOCATION-BASED MARKETING TOOLS AND CAMPAIGNS

LOCATION-BASED MARKETING TOOLS	DESCRIPTION
Geo-social-based services marketing	Users share their location with friends. Can be used for check-in services like Foursquare; friend finders; transportation services.
Location-based services marketing	Provides services to consumers looking for local services and products.
Mobile-local social network marketing based on users' location	Facebook expands offerings of deals by local firms in Feed display ads. Facebook Marketplace enables people to easily buy and sell within their local communities. Foursquare app Swarm focuses on social updates from specific locations and on sending recommendations and deals. Social network monitoring: sends messages within an app based on mentions of interest in products in Facebook and Twitter posts. MomentFeed allows marketers to listen to social chatter on social networks by location and then target consumers with geo-specific ads. Used by Pizza Hut, Starbucks, and local restaurants. Intent marketing: scanning social networks for indications of real-time consumer interest in specific products.
Proximity marketing	Sends messages to consumers in the area of a store or outlet to generate sales using a virtual fence around a retail location (could also be an airport, train station, or arena). Generally opt in. Whole Foods places geo-fences around its stores to target ads and offers to mobile users passing by.
In-store messaging	Messaging consumers while they are entering or browsing in a store. Retailers collect, analyze, and respond to customers' real-time shopping behavior. Macy's, Lord & Taylor, and Target use beacon marketing to greet customers and offer deals.
Location-based app messaging	PayPal's mobile app detects customers near a store that offers PayPal payment options and entices them with offers to visit the store.

Proximity Marketing with Beacons

Although all location-based marketing is in some sense proximity marketing, Apple's introduction of iBeacon in 2013 with its iOS 7 made it possible for physical store retailers to communicate directly and quite precisely with customers as they passed within a few feet of in-store beacons. There are many close-proximity technologies, such as QR codes, Wi-Fi, and NFC (Near Field Communication), but each has drawbacks in terms of precision, cost, and widespread availability. Apple's iBeacon uses a technology called Bluetooth Low Energy (BLE). Android phones also have this capability. BLE is inexpensive to implement and uses much less power than traditional Bluetooth. Unlike QR codes, BLE has a two-way, push-pull communication capability. Using QR codes, consumers need to show the code to a QR scanner, and then they see information about a product. With iBeacon, consumers can be contacted as soon as they walk into a store, be exposed to special offers, and then, while browsing the store, be contacted as they pass specific areas, like the jewelry department. This all takes place automatically on the user's iPhone. Consumers can respond to these messages as well (Lee, 2021).

For retailers, in-store beacon marketing is aimed at four objectives. First, the customer can be engaged immediately upon entering the store and then be virtually accompanied from one area to another, somewhat similarly to how luxury retail stores assign a salesperson to high-end consumers. Second, beacons can be used to stimulate loyalty programs. Consumers who are frequent buyers can be noticed upon entering the store. Third, retailers can engage in flash sales, instant discounts, and other impulse marketing programs inside their physical stores. Finally, beacons can be used unobtrusively, not pushing offers or goods but instead just gathering data directly about in-store consumer behavior. Beacons are also being used in many other industries, such as food services, travel and tourism, banking, and entertainment and sports venues (Hegde, 2022),

Currently, beacon technology, essentially in-store Bluetooth devices that can communicate with user smartphones upon entering the store, consists of stand-alone apps, each following different standards. But several technology firms are trying to build beacon capabilities into their popular platforms. Google's Eddystone open-source standard can work with iOS or Android (Adarsh, 2022). Advertisers are beginning to take advantage of this technology

A number of retailers are using beacon technology. For instance, Target uses the technology to map routes for customers to help them locate products on an aisle-by-aisle basis. Customers enter their shopping lists into the app, and the app will produce an automatic shopping plan for them, with products highlighted as pins on the app's store map. Sephora uses beacon technology for a variety of purposes. Its beacon-enabled app provides a map of the store and daily promotions. The app also gives store reps access to a customer's purchasing history so that they can help the customer locate desired products more easily. When customers enter a store, the app offers them in-store makeovers and reminds them about payment options. At its Duane Reade locations, Walgreens sends its customers coupons and discounts, and customers can digitally "clip" the coupons and redeem them with their smartphones. This helps influence customers' in-store purchasing decision (Hegde, 2022; Davies, 2022).

However, despite the claims of proponents of beacon marketing, beacon technology has not yet revolutionized mobile marketing. Beacons require users to have Bluetooth turned on. But only 20% of smartphone users in the United States have Bluetooth turned

on, and another 20% didn't believe that their smartphones had Bluetooth (even though they likely did have it). Consumers may also be concerned about the privacy and security implications of being tracked through a store or on the streets (Kwet, 2019). Many do not want to be bothered with in-store notifications and may resent the intrusion. Nevertheless, the beacon technology market is expected to continue growing through 2027, when it is expected to reach more than $14 billion (ResearchandMarkets, 2022). The retail sector is expected to be the primary generator of revenues, accounting for more than 55% (DeCode Staff, 2019; Nechay, 2019).

STARTING A LOCATION-BASED MARKETING CAMPAIGN

As with all marketing campaigns, start by identifying your objectives and understanding just how a location-based mobile marketing campaign might help your business. Location-based marketing is generally much more action-oriented than are other forms of online marketing. A person is in a given location for only a short time, measured in minutes and hours, rarely days or weeks. If you want the consumer to do something, you want the consumer to do that something now. Does your product or service have this quality? Is there something related to a person's location that fits with your product? Is there something about your products that makes them especially attractive to a mobile audience at a specific location and time? There are very few products and services that don't have a location connection.

Next, consider the target demographic for your campaign and products. Location-aware consumers (those with mobile devices and familiarity with location-based services) tend to be a younger, more educated, and wealthier demographic than non-location-aware consumers. They have many of the same characteristics as all mobile shoppers.

A strategic analysis of your marketspace is very important. The same questions that you would seek to answer if you were doing a non-location-aware mobile marketing campaign, such as determining what your competitors are doing, apply to a location-based marketing effort.

After you have envisioned your marketing campaign and identified your market, it is time to start implementing your mobile campaign. The same steps that you would follow in implementing a mobile campaign apply to a location-based marketing campaign as well. Note that you can't do everything—mobile-centric *and* location-based—at once. Start by doing something simple like local search. Then consider more sophisticated local-based marketing tactics.

MEASURING LOCATION-BASED MARKETING RESULTS

There are a great many ways to measure the success of a mobile location-based campaign, some very sophisticated. The measures of success will vary depending on the objective of the campaign, which might be to raise the awareness of your brand among consumers, to bring customers to your retail store, or a click-to-call campaign in which you want people to make reservations for a concert.

Because mobile local campaigns use the same marketing ad formats as both traditional and mobile web marketing, the basic measures of effectiveness are similar. For instance, the number of impressions (people who see an ad), click-through rate, and unique visitors are basic measures for a mobile local campaign. But mobile location-based

TABLE 7.16 MEASURING MOBILE LOCATION-BASED MARKETING RESULTS

MARKETING PROCESS	MEASUREMENT
Acquisition	Impressions; click-throughs; unique visitors to a mobile or desktop website or app; pages viewed; time on site.
Engagement	Inquire; reserve; visit a physical store; check maps for directions; register; request more information; posts and comments; responders to offers; Likes generated per visitor; click-to-call rate.
Amplification	SMS to friends; notify friends of location; share location or offers with friends.
Community	Content generated by visitors or responders; reviews; posts; positive comments generated.
Sales	Purchases; percentage increase in sales because of local mobile campaign; percentage of customers from local mobile campaign.

marketing is much more personal and social than traditional web marketing or even simple mobile marketing: It's a marketing message directed to a consumer's personal mobile device based on that person's location. Local mobile marketers hope consumers will take follow-on actions almost immediately—to inquire, reserve, click-to-call, friend, and ultimately purchase. **Table 7.16** describes some of the basic dimensions and metrics to use when evaluating a mobile marketing campaign. The nature of the location-based campaign makes a difference for how you measure success. For instance, in a click-to-call campaign, you want to measure the number of calls, the duration of calls, new versus existing customers, and the number of accidental or hostile calls.

7.5 CAREERS IN E-COMMERCE

Social marketing is one of the fastest-growing segments of online marketing (the other being mobile marketing); it is estimated that advertisers will spend more than $75 billion on this segment in 2022. If you love using social media, a position in social marketing may be an excellent fit. Possible job titles include social media associate, social media analyst, social media coordinator, social media planner, social community manager, and social media strategist, among others.

THE COMPANY

The company is a marketing and public relations company. Founded in 2005 as a traditional media platform agency, it has changed the focus of its business to social media platforms such as Facebook, Instagram, TikTok, Twitter, Snapchat, and Pinterest. The firm designs, develops, and manages websites, social network pages, blogs, and long-form research reports for a variety of clients in financial services, publishing, and educational institutions. The company has 550 employees with a diverse range of skills from content creators to graphic artists, web designers, researchers, and digital marketing specialists with a focus on social and mobile campaigns.

THE POSITION: SOCIAL MEDIA MARKETING ASSOCIATE

You will work with the Digital Marketing Department. The Social Media Marketing Associate role is an entry-level position. Social Media Marketing Associates create content and manage specific projects for nonprofit and corporate clients involving social media marketing. Responsibilities include:

- Creating various types of content for social media marketing campaigns for multiple clients.
- Writing and editing blog posts.
- Creating and editing long-form content (e-books, reports, infographics, slide decks, etc.).
- Creating landing pages, forms, and ad content using marketing software tools.
- Managing paid promotions on various social networks.
- Conducting A/B testing programs for social media ad campaigns.
- Creating and editing reports.
- Proofreading print and digital content for grammar and typographical errors.
- Brainstorming strategies for social media marketing efforts.

QUALIFICATIONS/SKILLS

- College degree in humanities, social sciences, or marketing, with course work in digital marketing, e-commerce, and/or graphics design
- Experience with personal or business social networks and blogs
- Excellent writing and communication skills
- Propensity for technology and creative thinking
- Basic understanding of website design, digital media, and content marketing
- Interest in the causes/business goals of our clients
- Willingness to engage in problem solving in a collaborative environment
- Strong organizational skills and attention to detail
- Desire to grow in learning and professional development

PREPARING FOR THE INTERVIEW

This chapter provides you with the foundational material that you should be familiar with when interviewing for a position in social marketing. Begin by reviewing Section 7.1 so that you can demonstrate your knowledge of the broad trends in social marketing, especially the idea of conversations with consumers as opposed to simply displaying ads. The rapid growth of mobile marketing and its connection to social marketing are also important (Figures 7.1 and 7.2). Review Section 7.2 to demonstrate your understanding of the key players in social marketing and the basic process of social marketing (Figure 7.4). The concepts of amplification and community are key to the success of social marketing. Chances are good that your new position will require you to engage with one or several of the major social platforms, such as Facebook, Instagram, TikTok, Twitter, and Pinterest. Review the parts of Section 7.2

that describe the marketing tools for each of these social networks. Also pay attention to how the results of campaigns on each social network can be measured. You can impress your interviewer by describing some of the successful social marketing campaigns listed in Tables 7.3, 7.5, 7.7, 7.9, and 7.11. You probably will earn some extra points by showing that you are aware of some of the issues involved in social marketing to children that were discussed in the *Insight on Society* case, *Marketing to Children in the Age of Social, Mobile, Local*. Although the job description does not mention mobile marketing explicitly, the subject will no doubt come up, as social and mobile are inextricably intertwined. Review Section 7.3 on the growth of mobile marketing and how much mobile time is spent on social networks. Location-based marketing is also not mentioned in the job description, but some of the firm's clients may be interested in geo-marketing, and it would be advisable to review the location-based marketing tools in Table 7.15.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. What kinds of experiences have you had creating social media content?

If you have not had previous experience creating social media content for a business, think about the types of content you have posted on your own social network profiles, your purpose in posting the content, and the impact your content had on the target audience. If you have had experience working on a social media marketing campaign, describe your role, the challenges you faced, and how you solved these challenges.

2. One of our clients is a media firm that focuses on health and exercise. Currently, its primary market is adults older than age 55. The client would like to target 24- to 36-year-olds. How do you think a firm like this could use Facebook or other social networks to promote its products?

You might suggest that Millennials are very attracted to video and that YouTube, Facebook, and Instagram videos are a good way to reach this market. Also, Facebook Feed display ads are effective and inexpensive when they are targeted to the correct groups, such as to people who have expressed an interest in exercise or who belong to networks that have a health and exercise theme. You might also mention that Millennials are much more likely to use their mobile devices on social networks and, therefore, that the emphasis for this client should be on reaching the younger mobile audience.

3. One of our clients is a regional retail bank. They report that more and more of their customers are using mobile devices to access their services. How would you recommend that the bank use social marketing?

You might suggest that because this bank has a built-in mobile-aware customer base, it seems an ideal audience to reach via social networks such as Facebook and Twitter and also LinkedIn, which attracts professionals, just the kind of new customer the bank will be seeking to attract. Also, the bank's own mobile app is an ideal place to display new products and services.

4. Many of our clients are small businesses like health food stores, restaurants, and specialty retailers. What would you suggest is a good way to reach their local customers via social media?

Local businesses are ideally suited to use social mobile marketing to reach their audience. Google is one of the largest local marketing firms and provides location, contact, and product and service descriptions. Also, location-based marketing is readily available on Facebook and other social networks. Local businesses could use the firm's help in setting up Google ads and Facebook pages and in implementing a geo-marketing program that might include proximity marketing and in-store messaging.

5. The online marketing process has changed for most of our clients in part because people are using multiple screens, from TVs to desktops and to mobile devices. How should we advise our clients about which platforms to use and how to build a consistent brand over all these channels?

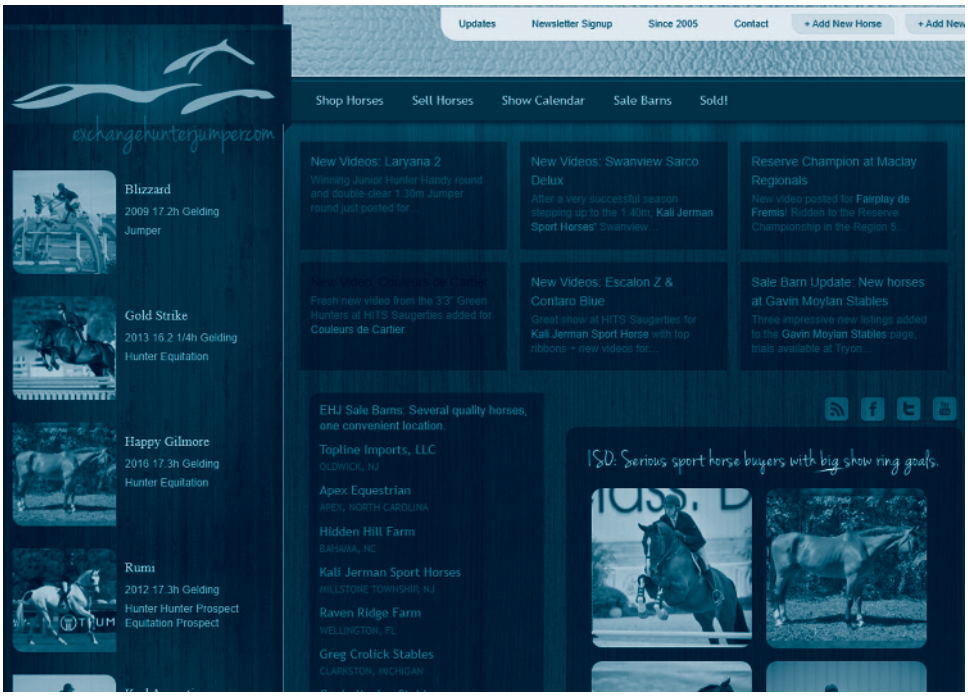
You can impress your interviewer by agreeing that screen diversity means that a single ad cannot be used on all platforms but needs to be adjusted to fit different devices and screen sizes. The graphics and creative elements will need to be adjusted for each platform in what is called responsive design. In some cases, firms may have to develop very different ads for different platforms. This will add to costs. But firms generally will need to appear on both desktop and mobile devices.

7.6 CASE STUDY

Exchangehunterjumper.com:
Building a Brand with Social Marketing

The Internet and Web have enabled thousands of business ideas to become online realities. The Internet has reduced the costs of starting a small business and has allowed small players to effectively use the same marketing and selling tools as major corporations use. Small businesses usually occupy a market niche that is not occupied by big players or corporations. One such market niche in the United States, comprising about 10,000 to 30,000 players, is the high-end horse show circuit. These are people who are willing to drop $200,000 on a horse that can jump a five-foot fence with ease. This may be a very small market, but its members are highly motivated to both buy and sell horses, and they are willing to spend a lot of money in the process. ExchangeHunterJumper.com is one example of how a small business focusing on a tiny niche market was able to successfully build an online brand.

According to Dagny Amber Aslin, founder and owner of ExchangeHunterJumper.com ("The Exchange"), a website created to help owners and professional trainers sell high-end competition horses, it's hard to "get rich" or even make money on the Internet. She adds, "There are a lot of preconceived notions.... I beat down a path previously



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unplowed. It cost us a lot of money and we suffered many setbacks from our mistakes." Yet the site is still growing and has succeeded where others failed. How did Aslin break through and develop a site that works for professionals buying and selling alike? How did she build trust? How did she market her services?

Experience helped. Aslin started with applicable experience—in the horse world and in the world of Internet marketing. In addition to riding and competing as a child, Aslin spent several years working as a professional trainer. Working six-day weeks, including weekends, and spending most of her time outdoors riding, teaching, and competing, she saw first-hand the challenges facing professional horsemen, and she gained valuable credibility with those who would become her audience.

While working in the horse business, she took a part-time job as an assistant to a top California real estate agent, helping him market and sell high-end real estate in the Santa Barbara area. Among other activities, she helped him develop and expand his website. Because of that experience, she realized that "selling six-figure horses and seven-figure houses are ridiculously similar—both tend to be overpriced, have emotional strings attached, require vettings and exhaustive negotiations, involve agents, and the list goes on." In 2005, when she moved from California back to the Midwest, where she had spent her childhood, The Exchange was born. Thirteen years later, the equine marketing model she has built is a customized version of the real estate program she assisted with in Santa Barbara.

Aslin knew that busy horse professionals needed a high-quality, reliable source of suitable mounts for their clients and that their day-to-day business lives left them little time to thoroughly search the market; they often also lacked a good grasp of modern media technology. The same dilemma applied when it came to selling high-end horses. In response, she created an organized, professional process for preparing online horse sale advertisements. It included detailed forms for sellers to fill out, and she insisted that quality photos and videos be provided for each horse advertised, thus enabling her to turn the descriptions into accurate portrayals of each animal and its capabilities. She created a fee structure that was reasonable and affordable, and she developed a multi-channel marketing program.

Aslin understood that her business plan needed to be a living document that evolved over time based on what the market was telling her. This helped her make inroads into a traditional industry that is very resistant to change. Most horse professionals spend their days outside and tend to do business only with those they know personally: The level of trust is very low. Most existing horse sale websites were little more than online classifieds cluttered with unreliable information. Although professional horsemen were slow to use computers and the Internet, the rise of smartphones and tablet computers has helped increase their comfort level with technology and has been a huge factor in the increased online involvement of horse professionals.

The Exchange took all of these things into account, and Aslin went further. In order to remain true to her business goal of providing a reliable service to professionals in the horse industry that would become a source of good horses described accurately, Aslin personally reviewed all potential advertisers. In some cases, she went back to sellers and insisted that they provide higher-quality photographs and videos, and in cases in which she determined that the horse was not as represented, she turned down their business. The initial business plan process involved strict screening, and it meant turning away money and valuing quality over quantity in every area—horses, buyers, traffic, and ads.

It was a hard and expensive premise to adhere to when building a reputation from scratch, but her persistence and dedication worked, and today, The Exchange's reputation and "brand" have become two of its most valuable assets.

In discussing some of the obstacles she faced in getting The Exchange up and running, Aslin starts with education—her own or lack thereof—specifically in the areas of graphic design and web technology. Although she knew what professional horsemen needed, she did not know how to translate those needs into graphic design or onto the Web. She says that looking back on the original logo and print designs is "a painful exercise," but she is happy with the current direction of her business.

The budget was also an initial obstacle, as there wasn't a lot of money to spend up front. However, in hindsight, she believes that the lack of money gave her an advantage because she had to learn what her market wanted and was able to do so without breaking the bank. Conversely, her main competitor took an opposite track, spent big money up front, missed the mark with customers, and is now defunct.

In addition, she faced the negative perception among industry professionals and prospective buyers that equine Internet advertising was "worthless." Further, much of her target audience barely knew how to use a computer, didn't have e-mail addresses, and had been doing business in the same old-school manner for decades. For a few key players, doing business that way worked very well, but it left a void for those outside that inner circle to move horses. Through a combination of knowledge of the marketplace, on-the-job training, perseverance, and listening to what the market was telling her, The Exchange has successfully begun to fill that void. Today, The Exchange typically manages the marketing of 160–180 horses at any given time and anticipates that this number will likely increase to more than 200 horses in the near future.

Here's how it works: The Exchange handles advertising for sellers and trainers across the country. In 2022, the prices of show horses advertised on The Exchange range from $25,000 to $250,000. The Exchange specializes in hunter-jumper show horses and, specifically, those suited for high-level competition.

Trainers/sellers who sign up for a premium listing pay a flat $250 fee for the initial advertisement and a subscription fee of $35 per month (less for multiple horses), which includes a listing on The Exchange's website featuring the horse's details, photos, show record, lineage, and videos. The Exchange provides copywriting services and professionally edits all videos supplied by sellers, hosting the videos on its private server and making them available to download, embed, and share. Each listing typically takes 8–10 hours to prepare. The Exchange also offers a second listing alternative—a Sale Barn listing for $300 a month that allows for listings of up to 10 horses. A three-month commitment is required, but there are no initial or other fees. As soon as the commitment is fulfilled, sellers can deactivate and then reactivate their Sale Barn page as needed at any time and without any further charge. Aimed at high-volume operations with frequent turnover, the Sale Barn page can link to the seller's website, YouTube, Facebook, and Twitter feeds, if available, with the goal of increasing overall brand awareness for the seller's business. Aslin designed the Sale Barn as an affordable option for professionals who might otherwise be reluctant to spend on marketing. The Sale Barn page provides sellers with a mini website and social media advertising, including three sidebar Facebook ads each week. These ads have the advantage of promoting not only the sellers but also the Sale Barn package itself because those who click on the ad end up on the ExchangeHunterJumper.com website and are able to see its

services first-hand and in depth. International sellers are given a slight additional discount. The Sale Barn program has proven to be a major success, with 11 different sale barns listed.

Statistics show that a horse's first month online is the most successful one in terms of the number of web page visits. With the addition of monthly campaign management, The Exchange helps keep each horse's marketing fresh and up to date. Updates can immediately escalate a horse's popularity and attract new potential buyers. Sellers are encouraged to provide updates as frequently as possible. Online videos add to the brand of the horse for sale and are especially important for young horses or those "growing into" their price tags. Updates are added to the website and promoted through various media outlets including Facebook and e-mail campaigns.

Sellers currently fill out two separate forms: a credit card registration form and an equine fact sheet. The fact sheet includes a long series of checkboxes from which sellers select preworded traits and is coupled with space for additional written descriptions. This saves some production time, although writing the actual copy is still a major part of the value that The Exchange provides. To implement this option, Aslin spent time investigating form-building tools. Custom-built form solutions were likely to be too expensive, so she played with numerous online form generators and ultimately was able to find some that offered great functionality at a relatively low cost. So, for example, after a seller indicates that the horse is a "jumper," questions specific to jumpers will be displayed.

The Exchange develops a specific marketing strategy for each horse listed. This strategy includes reviewing the information submitted, combing through a horse's official show record, considering impartial impressions, and identifying the most likely buyers. If The Exchange thinks that the photos or videos don't help to sell the horse, the seller is advised on how to improve them. This advice stems from experience in marketing all types of horses from coast to coast and from an understanding of the various buyer profiles and geographic trends that exist in the market.

Social marketing forms the core of The Exchange's marketing efforts. Starting in 2009, The Exchange began experimenting with social media, including YouTube, Facebook, Twitter, and Instagram. Aslin notes that when she began The Exchange, social media was not yet the phenomenon that it is today but that when its significance started to become apparent, she had no choice but to jump in and begin using it, learning as she went.

In the past, Facebook was The Exchange's primary social media platform, but in 2021, the Exchange's Facebook page was hacked, and as a result, Facebook shut the page down. Aslin now relies on her personal Facebook page (she has more than 3,000 friends and followers) as well as on marketing through various Facebook Groups that are focused on sales of the types of horses marketed on The Exchange.

ExchangeHunterJumper.com also has loyal followers on Instagram and Twitter, which tend to attract a younger demographic than Facebook. The Exchange's Instagram feed has more than 9,000 followers. The Exchange's Twitter account has about 2,000 followers. Aslin is trying to improve The Exchange's Twitter "voice" to be more conversational and consumer-centric because she has noticed that anything that resembles an "ad" is not effective. Although Aslin doubts that many of these followers are actual buyers or sellers at this time, she notes that in the future, they probably will be. Her site has grown up along with her clientele, and children who once drooled over the ponies on her site are now soon-to-be adults and, possibly, young professionals.

Developing the actual social media content, which needs to be presented in such a way as to attract attention, is another challenge, as is determining the optimal amount and timing of new content to post each day. Aslin notes that if she posts too many times a day or posts too much content too close together, the reach of her posts seems to drop off. Content creation for all of the different social media channels has become a full-time job in and of itself and poses some not-inconsequential pitfalls for the layperson. If done incorrectly, it can take up an inordinate amount of time with only a low return on investment, and one social media misstep can unleash a major image crisis that can unravel years of branding work.

Because every business is different, The Exchange's experience suggests that it's important for e-commerce sites to experiment with social media in order to determine which outlets are most effective in reaching the target audiences. To track the effectiveness of her social marketing efforts, Aslin uses various tracking systems. For instance, Google Analytics allows her to track exactly how many people are on the ExchangeHunterJumper site in real time and how they got there. Aslin has found that focusing solely on Likes is not sufficient. For example, she notes that a photo she posted advertising a horse on Facebook generated only 10 Likes but that almost 150 people followed the link associated with the photo to the ExchangeHunterJumper website. She also uses a short URL service, Bitly, to create unique URLs associated with Facebook and other social media posts that have built-in click trackers. This enables her to quickly see the collective success of her social marketing efforts; in a good month, bit.ly stats show around 8,000 click-throughs to the ExchangeHunterJumper site.

The firm's website is also a key element of its e-commerce presence. Aslin continually reviews the design of the website with an eye toward making it the most effective marketing tool possible. She built the original site herself in 2005 and updated it almost yearly in response to her target market's needs. In 2012, Aslin relaunched the site for a fifth time, and for the first time ever, she hired a professional web development team to convert the static HTML site into a dynamically driven content management system on the Expression Engine platform. Although she was able to keep costs low by designing and developing the site's CSS layout, the advanced functionality that she desired, such as the sale horse filter that enables shoppers to sort horses based on price, location, gender, type, and size, still required a hefty five-figure investment. Aslin believes that the abilities to get to know the market and to update the site accordingly has kept The Exchange fresh and innovative. Every iteration of the website has been focused on meeting the target market's needs. For instance, she has also spent considerable time and expense to make sure that The Exchange's website, including videos, works just as well on mobile devices as it does on a traditional laptop or desktop computer. However, given the changes in Google's search algorithms with respect to mobile sites, which has had the effect of pushing The Exchange down in search results, Aslin is once again considering a redesign. She notes that although users in the past were relatively easy to impress and satisfy, today's users have high expectations for website quality and performance.

In addition to the website, The Exchange uses a variety of other marketing strategies, including e-mail campaigns, magazine advertising, and word of mouth. It ceased distributing its four-color, printed National Sales List booklet because of its high cost and now relies almost totally on various types of online marketing. Aslin has found it to be extremely helpful to have the web development experience that she has honed over the years. Here are some of her words of wisdom: She feels that entrepreneurs don't

necessarily have to know how to build sites, but they do need to be familiar with what is and what is not possible in site construction. It is important to understand which functions are complicated and which are not so that overly complicated add-ons that don't really add to the user experience can be eliminated from tight budgets. It's also important to know what technology is popular now and what technology is just around the corner. Even if you think you are proficient in all the tasks that you will need in order to launch your business, with the rapid pace of technology you will inevitably spend much of your time learning something totally new, whether you want to or not.

By paying attention to these words of wisdom as well as to the details at every step of the marketing process, The Exchange has managed to build a successful brand, one that the horse community has come to rely upon.

Sources: ExchangeHunterJumper.com, accessed September 2022; Interview with Amber Aslin, founder of ExchangeHunterJumper, August 2020, November 2018, October 2017, November 2016, September 2014, September 2013, and September 2012.

Case Study Questions

1. Find a site on the Web that offers classified ads for horses. Compare this site to ExchangeHunterJumper.com in terms of the services offered (the customer value proposition). What does The Exchange offer that the other site does not?
2. In what ways was social media effective in promoting The Exchange brand? Which media led to the highest increase in sales and inquiries? Why?
3. Make a list of all the ways that The Exchange attempts to personalize its services to both buyers and sellers.

7.7 REVIEW

KEY CONCEPTS

■ **Understand the difference between traditional online marketing and social-mobile-local marketing platforms and the relationships among social, mobile, and local marketing.**

- Social, mobile, and local marketing have transformed the online marketing landscape. The major trends and concepts include:
  - The emphasis in online marketing has shifted from exposing consumers to messages toward engaging them in conversations about your brand.
  - Social marketing means all things social: listening, discussing, interacting, empathizing, and engaging the consumer.
  - Social marketing and advertising is not simply another "ad channel" but, rather, a collection of technology-based tools for communicating with shoppers.
  - In the past, businesses could tightly control their brand messaging and lead consumers down a funnel of cues that ended in a purchase. However, today, businesses can no longer exercise such tight control. Instead, consumer purchase decisions are increasingly driven by the conversations, choices, tastes, and opinions of the consumer's social network.
- Social, mobile, and local marketing are the fastest-growing forms of online marketing.
- Social, mobile, and local digital marketing are self-reinforcing and connected.

- Local and mobile marketing are highly related: Local advertisers most often target mobile devices.
- The strong ties among social, mobile, and local marketing have significant implications for managing a marketing campaign. When you design a social marketing campaign, you must also consider that your customers will be accessing the campaign using mobile devices, and often they will also be looking for local content.

■ Understand the social marketing process from fan acquisition to sales and the marketing capabilities of social marketing platforms such as Facebook, Instagram, TikTok, Twitter, and Pinterest.

- In social marketing, the objectives are to encourage your potential customers to become fans of your company's products and services and to engage with your business by entering into a conversation with it.
- There are five steps in the social marketing process model: fan acquisition, engagement, amplification, community, and brand strength and sales.
- Facebook is a social network that is designed to encourage people to reveal as much personal information about themselves as feasible, including their activities, behaviors, photos, music, movies, and purchases.
- Facebook's features are built to maximize the connections among people in the form of notifications, tagging, messaging, posting, and sharing. In many instances, the movement of personal information is so widespread that it is beyond the understanding of users.
- Social density refers to the number of interactions among members of a group and reflects the "connectedness" of a group even if these connections are forced on members.
- Facebook has many marketing tools, including Brand Pages, Facebook Groups, Facebook Ads, and Facebook Live, and Messenger.
- Instagram is a visual social network. Users and advertisers post photos and videos to their friends, potential customers, and the public at large. Instagram marketing tools include display and video ads in the Instagram Feed, Stories, and Reels as well as Instagram Direct. Influencer marketing is a major method of marketing on Instagram.
- TikTok is a short-form video-sharing app. Many TikTok videos feature music, with users lip-syncing, singing, and dancing, whereas other videos focus on comedy and creativity. Influencer marketing is a major method of marketing on TikTok, but TikTok now also offers most of the same ad formats as other social network platforms.
- Twitter is a social network that allows users to send and receive 280-character messages as well as videos, photos, and article previews. Twitter marketing tools include Promoted Ads, Follower Ads, Twitter Takeovers, Branded Notifications, the Twitter Amplify program, Twitter Cards, and Twitter Live.
- Pinterest is a social network that provides users with an online board to which they can "pin" interesting pictures. The success of Pinterest is based in part on a shift in consumer behavior that is enabled by new technologies: People talk about brands using pictures rather than words. Pinterest marketing tools include brand pages; a variety of ad formats including images, videos, carousel, and shopping; search advertising, multi-page video Idea Pins; and Rich Pins.
- Other social networks, such as Snapchat, and LinkedIn, provide similar advertising opportunities to marketers.
- One downside of social marketing is that brands lose a substantial amount of control over where their ads appear in terms of other content and what people say about their brands on social networks.

■ Identify the key elements of a mobile marketing campaign.

- Mobile marketing involves the use of mobile devices such as smartphones and tablet computers to display banner ads, rich media, videos, games, e-mails, text messaging, in-store messaging, QuickResponse (QR) codes, and couponing.
- Mobile devices represent a radical departure from previous marketing technologies simply because the devices integrate so many human and consumer activities, from telephoning or texting friends to listening to music, watching videos, and using the Web to shop for and purchase goods.
- Mobile users spend the vast majority of their time using mobile apps as opposed to mobile web browsers. Marketers thus need to place their ads in apps where consumers spend most of their time.

- Mobile devices create a multi-screen world. The reality, and the future, of computing devices is that consumers will be multi-platform: using desktops and laptops at work and at home and using smartphones and tablets at home as well as when moving about.
- The implications of the multi-device platform, or screen diversity, environment are that marketing needs to be designed for whatever device the consumer is using and that consistent branding across platforms will be important.
- Unlike social marketing, mobile marketing does not require a great deal of new marketing vocabulary. All the marketing formats available on the desktop are also available on mobile devices. With few exceptions, mobile marketing is very much like desktop marketing—except that it is smaller, mobile, and with the user all the time.
- The major marketing opportunities in mobile marketing are search ads, display ads, videos and rich media, messaging (SMS/MMS/PPS), and other familiar formats like e-mail, classified, and lead generation.
- The effectiveness of mobile marketing can be measured using the dimensions of the social marketing process model: fan acquisition, engagement, amplification, community, brand strength, and sales. Traditional web-browser-based metrics also can be used when measuring mobile campaigns.

■ Understand the capabilities of location-based local marketing.

- Location-based marketing is the targeting of marketing messages to users based on their location. Generally, location-based marketing involves the marketing of location-based services.
- Examples of location-based services are personal navigation and point-of-interest, reviews, friend-finder, and family-tracker services.
- Location-based marketing depends on two technologies: accurate mapping software and mobile device geo-positioning technologies like GPS, Wi-Fi network location data, and Bluetooth low energy (BLE) technology.
- Location-based mobile marketing is currently a small part of the online marketing environment but is expected to grow in importance.
- The ad formats used in local mobile marketing are familiar—search ads, display, social/native advertising, video, and SMS text messages. A very large percentage of these local mobile ads will be delivered by search engines such as Google and by social networks such as Facebook.
- The key players in location-based mobile marketing are the same giants of advertising that dominate the mobile marketing environment: Google, Meta, and Twitter.
- Geo-aware techniques identify the location of a user's device and then target marketing to the device, recommending actions within the user's reach.
- Geo-targeting of ads involves sending ads based on the user's location.
- Proximity marketing techniques identify a perimeter around a physical location and then target ads to users within that perimeter, recommending actions that are possible within the fenced-in area.
- In-store messaging involves messaging consumers while they are entering and browsing in a retail store. This type of messaging requires a very precise calculation of location.
- Consumers who seek information about local businesses using mobile devices are much more active and ready to purchase than are desktop users.
- Measuring the effectiveness of location-based mobile campaigns involves using the same techniques used for browser-based search and display ads (impressions) but also should include the dimensions of the social marketing process model such as acquisition, engagement, amplification, community, and brand strength and sales.

QUESTIONS

1. Describe the two factors that make social, local, and mobile marketing different from traditional online marketing.
2. Why are social, mobile, and local marketing efforts interconnected?

3. Why is the connection among social, mobile, and local marketing important to marketers?
4. What are the objectives of social marketing?
5. What are the major social networks?
6. What are the five elements of the social marketing process?
7. Why is LinkedIn attractive to advertisers?
8. List and briefly describe the basic Facebook marketing tools.
9. How can you measure the results of a social marketing campaign?
10. List and briefly describe Twitter marketing tools.
11. List and briefly describe Instagram marketing tools.
12. List and briefly describe TikTok marketing tools.
13. List and briefly describe Pinterest marketing tools.
14. Why is mobile marketing different from desktop marketing?
15. What is the fastest-growing m-commerce platform, and why?
16. Why are in-app ads so important to marketers?
17. What is the multi-screen environment, and how does it change marketing?
18. What kinds of ad formats are found on mobile devices?
19. Why is location-based marketing so attractive to marketers?
20. List and describe some basic location-based marketing tools.

PROJECTS

1. Choose two different online companies, and for each, try to identify the social, mobile, and local marketing efforts the company has implemented. Do they use social plug-ins on their websites? Do they have a Facebook page? If so, visit those pages to see how the companies are using them. How is the Facebook page different from the company's website? Can you identify how the firms use mobile marketing? Use your smartphone or tablet to access their apps, if they have them, and their websites. Are their websites designed specifically for each platform? In conclusion, compare and critically contrast these firms, and make recommendations for how you, as a marketing manager, would improve their effectiveness.

2. Visit your Facebook profile page, and examine the ads shown in the right margin. What is being advertised, and how do you believe it is relevant to your interests or online behavior? Make a list of ads appearing in your Feed. Are these ads appropriately targeted to you in terms of your demographics, interests, and past purchases? Surf the Web, visiting at least two retail websites. In the next 24 hours, do you see advertising on Facebook related to your surfing behavior?

3. Visit two websites of your choice, and apply the social marketing process model to both. Critically compare and contrast the effectiveness of these sites in terms of the dimensions of the social marketing process. How well do these sites acquire fans, generate engagement, amplify responses, create a community, and strengthen their brands? What recommendations can you make for these sites to improve their effectiveness?
4. Identify two Pinterest brand pages. Identify how they use the Pinterest marketing tools described in this chapter. Are there some tools they are not using? What recommendations can you make for these companies to improve their Pinterest marketing campaigns?

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CHAPTER 8

Ethical, Social, and Political Issues in E-commerce

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

8.1 Understand why e-commerce raises ethical, social, and political issues.
8.2 Understand basic concepts related to privacy and information rights, the practices of e-commerce companies that threaten privacy, and the different methods that can be used to protect online privacy.
8.3 Understand the various forms of intellectual property and the challenges involved in protecting it.
8.4 Understand how the Internet is governed, and identify major governance issues raised by the Internet and e-commerce.
8.5 Identify major public safety and welfare issues raised by e-commerce.

NEW Video Cases

See **eText Chapter 8** to watch these videos and complete activities:

8.1 Is TikTok a Surveillance Tool?

8.2 NFT and Trademarks: Hermès Sues Over Birkin Bag NTFs

The Right to Be Forgotten:

Europe Leads the United States on Internet Privacy

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In 2014, Google was forced to begin removing certain search engine query results in Europe after a ruling by the Court of Justice of the European Union (CJEU), Europe's highest court. The ruling gave individuals the right to request that certain links to personal information found through a search of their names be removed. The CJEU's ruling has come to be known as the "right to be forgotten" (sometimes given the acronym RTBF or sometimes referred to as the "right to delist"). The CJEU's ruling was the beginning of a new era of digital privacy in the European Union. The ruling was based on the simple idea that individuals have a right to manage their online personal information and public image. Google, Meta (Facebook), Twitter, and many other U.S. Internet-based firms whose business models depend on virtually no limitations on the collection and use of personal information lobbied strongly against the idea that individuals have a right to manage their personal online information. However, the CJEU's decision was final, and Google and other major search engines are now implementing the ruling, a task that although appearing simple in concept, has proven to be devilishly difficult and expensive in practice.

The CJEU's decision was based on a 2010 lawsuit brought by Spanish citizen Mario Costeja Gonzalez, against *La Vanguardia* (a Spanish newspaper), Google Spain, and Google Inc. (the U.S. parent firm), which had linked his name with an auction notice in the newspaper saying that his house had been repossessed and was being sold in order to pay off his debts. A Google search on Gonzalez's name returned a link to the newspaper notice as the most prominent link. Gonzalez's suit said that issues of his debt and foreclosure had been resolved years ago and that the reference to this event was irrelevant and an invasion of his privacy as defined in the European Union Data Protection Directive, which at the time governed personal information in the 28 countries that made up the European Union. Gonzalez requested that the newspaper remove or alter the pages it posted on the Web and that Google Spain and Google Inc. be required to remove the link between his name and the auction notice in the newspaper. Gonzalez said that he was not worried about his online image as much as the link's impact on his work and his reputation as a lawyer and on the potential of the notice to injure his law business. There had also been thousands of other requests by Europeans asking Google to remove links to their Names that they claimed were inappropriate, inaccurate, and no longer relevant and that interfered with their privacy.

Google and the newspaper argued that because the server providing the results for Google searches in Spain was located outside Europe, EU rules and privacy legislation did not apply. Google also argued that it was a search engine that simply provided links to information stored by others, not a data repository, and that it was not responsible for the accuracy or relevance of information stored by other organizations. Consequently, Google claimed that it should not be subject to the EU Data Protection Directive because the Directive pertained only to data repositories. Finally, Google argued that under European law, individuals did not have the right to request that their personal data be removed from accessibility via a search engine. In public statements, Google said that it would be difficult or impossible to respond to thousands or millions of requests to eliminate links; that granting these rights would allow criminals, fraudsters, sexual predators, and corrupt public officials to rewrite history; and that it would be very expensive to respond to requests and would potentially limit innovation in the future.

In 2014, the CJEU ruled that EU data protection policies were not limited by territory and that they applied to search engines no matter where the servers are located. Second, the CJEU found that search engines were "controllers" of individual personal data within the European Union and therefore must comply with EU rules. Prior to this ruling, search engines like Google had been considered merely processors of online data and, therefore, exempt from data protection rules in Europe. Finally, the CJEU found that Europeans did indeed have a right to ask search engines to remove links to personal information about them (the "right to be forgotten") when that information was inaccurate, inadequate, irrelevant, or excessive. The economic interests of the search engine to provide unfettered access to personal information did not justify interfering with an individual's rights to be forgotten and to have personal privacy.

The CJEU also clarified that the right to be forgotten was not absolute but would have to be balanced against other rights and obligations such as freedom of expression, freedom of the press, and the broader public interest. For instance, the CJEU's ruling did not require the newspaper to change any of the pages in its archives. The original auction notice thus remains in the newspaper. The public also has an interest in ensuring that convicted criminals not be allowed to escape their criminal records, which are public records in most jurisdictions. Rather than providing a blanket right granted to whoever applies to have information removed from search engines, the CJEU instead required a case-by-case assessment that examines the type of information, its potential for harm to the individual's private life, and the interest of the public in having access to that information. Also, for "public figures," those who have thrust themselves into public roles, such as politicians, celebrities, or business leaders, the public interest in knowing may trump the individual's private interest in being forgotten.

Regulators in France decided that they wanted to extend the right to be forgotten even further. They demanded that Google remove delisted search results globally, not just from European servers, even though this level of compliance was not required by the original ruling or by the EU regulations. In 2016, France fined Google for failing to remove delisted materials from servers located in the United States. Google appealed the decision to the CJEU and also expressed its concerns to the U.S. Department of Commerce, arguing that rulings by European courts could affect the experiences of Internet users in the

SOURCES: "Google Transparency Report," Transparencyreport.google.com, accessed August 28, 2022; "Blockchain's Forever Memory Confounds EU's 'Right to Be Forgotten,'" Bloomberglaw.com, August 3, 2022; "Google Quietly Rolls out the Right to be Forgotten Mechanism in the U.S," by Virginia Dressler, Oif.ala.org, June 14, 2022; "Into Oblivion: How News Outlets Are Handling the Right to Be Forgotten," by Linda Kinstler, *Columbia Journalism Review*, Cjr.org, October 5, 2021; "Most Americans Support Right to Have Some Personal Info Removed from Online Searches," by Brooke Auxier, Pew Research Center, Pewresearch.org, January 27, 2020; "California 'Right to Be Forgotten Law,'" by Emilie Elliott, Carnaclaw.com, October 28, 2019; "'Right to Be Forgotten' Privacy Rule Is Limited by Europe's Top Court," by Adam Satariano, *New York Times*, September 24, 2019; "Google Warns against Possible Expansion of 'Right to be Forgotten,'" by Wendy Davis, Mediapost.com, July 26, 2018; "The Right to Be Forgotten Risks Becoming a Tool to Curb Free Press," by Michael J. Oghia, Opendemocracy.net, July 9, 2018; "When 2 + 2 Might Equal 5," by Floyd Abrams, *New York Times*, May 7, 2018; "How Does California's Erasure Law Stack Up against the EU's Right to Be Forgotten," by Shaudee

United States. In 2019, the CJEU ruled in Google's favor, declaring that the right to be forgotten is not an absolute right and applies only within the European Union. Interestingly, although not legally required outside of California, in 2022, Google rolled out a policy expansion that allows U.S. citizens to request removal of certain personal information from Google Search.

The reactions to the CJEU's rulings and France's efforts to extend the right to be forgotten reflect a deep divide between Europe and the United States when it comes to privacy and the balance between personal information (privacy) and freedom of expression and the press. In Europe, many nations celebrated the original ruling as a victory over arrogant U.S. Internet companies and their cavalier attitudes toward user privacy. In the United States, U.S. newspapers and technologists emphasized the importance of a free press and warned against making it possible for individuals to hide their past misdoings. However, surveys indicate that nearly three-quarters of U.S. adults support some form of the right to be forgotten.

As of September 2022, Google said that it had received more than 1.3 million requests from people who wanted, in aggregate, more than 5.1 million links to online information about them removed and that it had removed about 49% of those links based on the internal guidelines that it has developed. France, Germany, Spain, and the United Kingdom together have generated the majority of delisting requests. Approximately one-quarter of requests relate to links on social media and directory websites, and another 20% pertain to news reports mentioning individuals. Although Google points to its removal rate as a sign that it is even-handed in its judgments about what content to remove, critics complain that the decisions should not be left in the hands of private companies.

In 2018, the European Union's General Data Protection Regulation (GDPR) codified many of the regulations pertaining to the right to be forgotten, terming it "the right to erasure." However, there continues to be tension over the mechanics of implementing the right to be forgotten. For instance, with the increasing use of blockchain technology—a distributed database that can never be changed and that can never "forget"—there may be instances in which the right to be forgotten may be impacted.

In the United States, the California Consumer Privacy Act (CCPA), which went into effect in 2020, provides California residents with the right to request deletion of personal information collected by certain businesses. Although not as broad as the GDPR, the CCPA is the first law in the United States to codify a right similar to the right to be forgotten and may be a harbinger of similar laws to come in other states.

Dehghan, Iapp.org, April 17, 2018; "Google Seeks to Limit 'Right to Be Forgotten' by Claiming It's Journalistic," by Chava Gourarie, Cjr.org, April 6, 2018; "GDPR: Look Out for 'Right to Be Forgotten Storms' Ahead," by Jon Oltsik, Csoonline.com, March 15, 2018; "The Right to Erasure or Right to Be Forgotten Under the GDPR Explained and Visualized," I-scoop.eu, accessed 2018; "The Right to Be Forgotten Is the Right to Have an Imperfect Past," by Susan Moore, *The Guardian*, August 7, 2017; "Google's Right to Be Forgotten Appeal Heading to Europe's Top Court," by Natasha Lomas, Techcrunch.com, July 19, 2017; "The Right to Be Forgotten," by Martin von Haller, Digitalbusiness.law, June 16, 2016; "Google Takes Right to Be Forgotten Battle to France's Highest Court," by Alex Hern, *The Guardian*, May 19, 2016; "Google to Extend 'Right to Be Forgotten' to All Its Domains Accessed in EU," *The Guardian*, February 11, 2016; "Google Will Further Block Some European Search Results," by Mark Scott, *New York Times,* February 11, 2016; "Right to Be Forgotten? Not That Easy," by Danny Hakim, *New York Times*, May 29, 2014; "EU Court Ruling a Victory for Privacy," *Der Spiegel*, May 20, 2014; "After European Court Order, Google Works on a Tool to Remove Links," by Mark Scott, *New York Times*, May 15, 2014; "Factsheet on the 'Right to Be Forgotten' Ruling," Court of Justice of the European Union, May 14, 2014; "European Court Lets Users Erase Records on Web," by David Streitfield, *New York Times*, May 13, 2014; "Daily Report: Europe Moves to Reform Rules Protecting Privacy," *New York Times*, March 13, 2014.

Determining how or whether personal information collected by online companies should be retained or deleted is just one of many ethical, social, and political issues raised by the rapid evolution of the Internet and e-commerce. For instance, as discussed in the opening case, the extent to which individuals can control the use of their personal information after it has been collected by an online company is still up for debate in the United States, with different laws in different states. In Europe, in contrast, individuals do retain rights to their personal information. These questions are not just ethical questions that we as individuals have to answer; they also involve social institutions such as family, schools, business firms, and, in some cases, entire nation-states. And these questions have obvious political dimensions because they involve collective choices about how we should live and what laws we would like to live under. In this chapter, we discuss and provide a framework for understanding the ethical, social, and political issues raised in e-commerce.

8.1 UNDERSTANDING ETHICAL, SOCIAL, AND POLITICAL ISSUES IN E-COMMERCE

The Internet and its use in e-commerce have raised pervasive ethical, social, and political issues on a scale unprecedented for computer technology. But why is this so? Why is the Internet at the root of so many contemporary controversies? Part of the answer lies in the underlying features of Internet technology itself and in the ways in which that Internet technology has been exploited by business firms. Internet technology and its use in e-commerce disrupt existing social and business relationships and understandings.

Consider, for instance, Table 1.2 (in Chapter 1), which lists the unique features of Internet technology. Instead of considering the business consequences of each unique feature, **Table 8.1** examines the actual or potential ethical, social, and/or political consequences of the technology.

We live in an "information society," where power and wealth increasingly depend on information and knowledge as central assets. Controversies over information are often disagreements over power, wealth, influence, and other things thought to be valuable. Like other technologies, such as steam, electricity, telephones, and television, the Internet and e-commerce can be used to achieve social progress. However, the same technologies also can be used to commit crimes, attack innocent people, despoil the environment, and threaten cherished social values. For instance, before automobiles, there was very little interstate crime. Likewise with the Internet. Before the Internet, there was very little "cybercrime."

Many businesses and individuals are benefiting from the commercial development of the Internet, but this development also exacts a price from individuals, organizations, and societies. These costs and benefits must be carefully considered by those seeking to make ethical and socially responsible decisions.

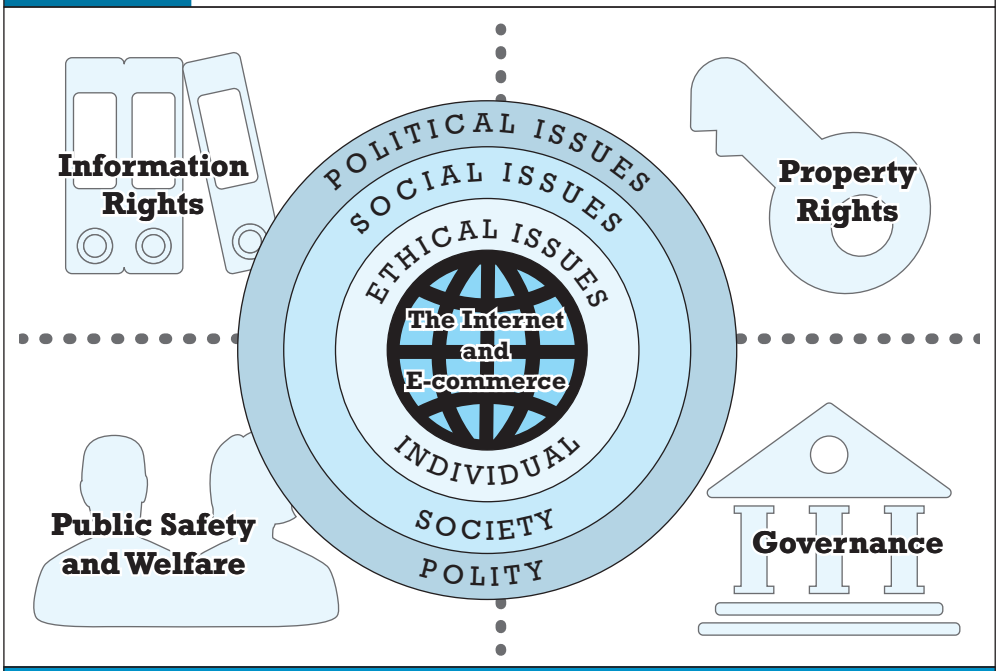
TABLE 8.1 UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY AND THEIR POTENTIAL ETHICAL, SOCIAL, AND/OR POLITICAL IMPLICATIONS

E-COMMERCE TECHNOLOGY DIMENSION	POTENTIAL ETHICAL, SOCIAL, AND/OR POLITICAL SIGNIFICANCE
Ubiquity—Internet/Web technology is available everywhere (at work, at home, and elsewhere via mobile devices) and anytime.	Work and shopping can invade family life; shopping can distract workers at work, lowering their productivity; use of mobile devices can lead to automobile and industrial accidents. Presents confusing issues of "nexus" to taxation authorities.
Global reach—The technology reaches across national boundaries and around the Earth.	Reduces cultural diversity in products; weakens small, local firms while strengthening large, global firms; moves manufacturing production to low-wage areas of the world; weakens the ability of all nations—large and small—to control their information destiny.
Universal standards—There is one set of technology standards, namely, Internet standards.	Increases vulnerability to malware and hacking attacks worldwide, affecting millions of people at once. Increases the likelihood of "information" crime, crimes against systems, and deception.
Richness—Video, audio, and text messages are possible.	A "screen technology" that reduces the use of text and potentially the ability to read by focusing instead on video and audio messages. Potentially very persuasive messages that may reduce reliance on multiple, independent sources of information.
Interactivity—The technology works through interaction with the user.	The nature of interactivity at commercial sites can be shallow and meaningless. Customer e-mails are frequently not read by human beings. Customers do not really "co-produce" the product as much as they "co-produce" the sale. The amount of "customization" of products that occurs is minimal, occurring only within predefined platforms and plug-in options.
Information density—The technology reduces information costs and raises quality.	Although the total amount of information available to all parties increases, so does the possibility of false and misleading information, unwanted information, and invasion of solitude. Trust, authenticity, accuracy, completeness, and other quality features of information can be degraded. The ability of individuals and organizations to make sense of this plethora of information is limited.
Personalization/Customization—The technology allows personalized messages to be delivered to individuals as well as to groups.	Opens up the possibility of intensive invasion of privacy for commercial and governmental purposes that is unprecedented.
Social technology—The technology enables user content generation and social networks.	Creates opportunities for cyberbullying, abusive language, and predation; challenges concepts of privacy, fair use, and consent to use posted information; creates new opportunities for surveillance into private lives by authorities and corporations.

A MODEL FOR ORGANIZING THE ISSUES

E-commerce—and the Internet—have raised so many ethical, social, and political issues that it is difficult to classify them all and, hence, complicated to see their relationship to one another. Clearly, ethical, social, and political issues are interrelated. One way to organize the ethical, social, and political dimensions surrounding e-commerce is shown in **Figure 8.1**. At the individual level, what appears to be an ethical issue—"What should I do?"—is reflected at the social and political levels: "What should we as a society and government do?" The ethical dilemmas you face as an employee or manager of an online business reverberate and are reflected in social and political debates. The major ethical,

FIGURE 8.1 THE MORAL DIMENSIONS OF AN INTERNET SOCIETY



The introduction of the Internet and e-commerce impacts individuals, societies, and political institutions. These impacts can be loosely classified into four moral dimensions: information rights, property rights, governance, and public safety and welfare.

social, and political issues that have developed around e-commerce can be loosely categorized into four moral dimensions: information rights, property rights, governance, and public safety and welfare. View the Figure 8.1 video in the eText for an animated and more detailed discussion of this figure.

Some of the ethical, social, and political issues raised in each of these areas include the following:

- **Information rights:** What rights to their own personal information do individuals have in a public marketplace, or in their private homes, when Internet technologies make information collection so pervasive and efficient?
- **Property rights:** How can traditional intellectual property rights be enforced in a digital society in which perfect copies of protected works can be made and easily distributed worldwide in seconds?
- **Governance:** Should the Internet and e-commerce be subject to public laws? And if so, what law-making bodies—state, federal, and/or international—have jurisdiction?
- **Public safety and welfare:** What efforts should be undertaken to ensure equitable access to the Internet and e-commerce? Should governments be responsible for ensuring that all members of society have access to the Internet? Are certain types of online content and activities—such as fake news, pornography, gambling, or anonymous tweeting of hateful language—a threat to public safety and welfare? What about public safety and welfare in the coming "metaverse"?

To illustrate, imagine that at any given moment, society and individuals are more or less in an ethical equilibrium brought about by a delicate balancing of individuals, social organizations, and political institutions. Individuals know what is expected of them; social organizations such as business firms know their limits, capabilities, and roles; and political institutions provide a supportive framework of market regulation, banking, and commercial law that provides sanctions against violators.

Now, imagine that we drop into the middle of this calm setting a powerful new technology such as the Internet and e-commerce. Suddenly, individuals, business firms, and political institutions are confronted by new possibilities of behavior. For instance, in the early years of the Web, it became possible to download perfect digital copies of music tracks from websites, without paying anyone for the music (something that previously would have been impossible), even though these music tracks still legally belonged to the owners of the copyright—musicians and record companies. Then, some entrepreneurs realized that they could make a business out of aggregating these digital music tracks and creating a mechanism for them, even though they did not "own" them in the traditional sense. The record companies, courts, and legislatures were not prepared at first to cope with the onslaught of online digital copying. Legislatures and courts had to create new laws and reach new judgments about who owns digital copies of copyrighted works and under what conditions such works can be "shared." It has taken years to develop new understandings, laws, and acceptable behavior in just this one area of the Internet's social impact. In the meantime, as an individual and a manager, you will have to decide what you and your firm should do in legal "gray" areas where there is conflict between ethical principles but no clear-cut legal or cultural guidelines. How can you make good decisions in this type of situation?

Before examining the four moral dimensions of the Internet and e-commerce in greater depth, we will briefly review some basic concepts of ethical reasoning that you can use as a guide to ethical decision-making.

BASIC ETHICAL CONCEPTS: RESPONSIBILITY, ACCOUNTABILITY, LIABILITY, AND DUE PROCESS

Ethics is at the heart of social and political debates about the Internet. **Ethics** is the study of principles that individuals and organizations can use to determine right and wrong courses of action. It is assumed in ethics that individuals are free moral agents who are in a position to make choices. When faced with alternative courses of action, what is the correct moral choice? Extending ethics from individuals to business firms and even entire societies can be difficult, but doing so is not impossible. As long as there is a decision-making body or individual (such as a board of directors or CEO in a business firm or a governmental body in a society), their decisions can be judged against a variety of ethical principles.

If you understand some basic ethical principles, your ability to reason about large social and political debates will be improved. In Western culture, there are four basic principles that all ethical schools of thought share: responsibility, accountability, liability, and due process. **Responsibility** means that as free moral agents, individuals, organizations, and societies are responsible for the actions they take. **Accountability** means that individuals, organizations, and societies should be held accountable to others for the consequences of their actions. The third principle—liability—extends the concepts

ethics
the study of principles that individuals and organizations can use to determine right and wrong courses of action

responsibility
as free moral agents, individuals, organizations, and societies are responsible for the actions they take

accountability
individuals, organizations, and societies should be held accountable to others for the consequences of their actions

liability
a feature of political systems in which a body of law is in place that permits individuals to recover the damages done to them by other actors, systems, or organizations

due process
a process in which laws are known and understood and there is an ability to appeal to higher authorities to ensure that the laws have been correctly applied

dilemma
a situation in which there are at least two diametrically opposed actions, each of which supports a desirable outcome

of responsibility and accountability to the area of law. **Liability** is a feature of political systems in which a body of law is in place that permits individuals to recover the damages done to them by other actors, systems, or organizations. **Due process** is a feature of law-governed societies and refers to a process in which laws are known and understood, and there is an ability to appeal to higher authorities to ensure that the laws have been correctly applied.

ANALYZING ETHICAL DILEMMAS

Ethical, social, and political controversies usually present themselves as dilemmas. A **dilemma** is a situation in which there are at least two diametrically opposed actions, each of which supports a desirable outcome. When confronted with a situation that seems to present an ethical dilemma, how can you analyze and reason about the situation? The following is a five-step process that should help:

1. **Identify and clearly describe the facts.** Find out who did what to whom and where, when, and how. In many instances, you will be surprised at the errors in the initially reported facts, and often you will find that simply getting the facts straight helps define the solution. It also helps to get the opposing parties involved in an ethical dilemma to agree on the facts.
2. **Define the conflict or dilemma, and identify the higher-order values involved.** Ethical, social, and political issues always reference higher values. The parties to a dispute all typically claim to be pursuing higher values (e.g., freedom, privacy, protection of property, and the free enterprise system). For example, supporters of the use of advertising networks such as Google Marketing Platform argue that the tracking of consumer movements online increases market efficiency and the wealth of the entire society. Opponents argue that this claimed efficiency comes at the expense of individual privacy and that advertising networks should cease their activities or offer the option of not participating in such tracking.
3. **Identify the stakeholders.** Every ethical, social, and political issue has stakeholders: participants who have an interest in the outcome, have invested in the situation, and usually have vocal opinions. Find out the identity of these groups and what they want. This knowledge will be useful later when designing a solution.
4. **Identify the options that you can reasonably take.** You may find that none of the options satisfies all the interests involved but that some options do a better job than others. Sometimes, arriving at a "good" or ethical solution may not always be a balancing of consequences to stakeholders.
5. **Identify the potential consequences of your options.** Some options may be ethically correct but disastrous from other points of view. Other options may work in this one instance but not in other, similar instances. Always ask yourself, "What if I choose this option consistently over time?"

ETHICAL PRINCIPLES

After your analysis is complete, what ethical principles should you use when making a decision as to how to act? Although you are the only one who can decide which ethical principles you will follow and how you will prioritize them, it is helpful to consider some

ethical principles that have deep roots in many cultures and that have survived throughout recorded history:

- **The Golden Rule:** Do unto others as you would have them do unto you. Putting yourself in the place of others and thinking of yourself as the object of the decision can help you think about fairness in decision-making.
- **Universalism:** If an action is not right for all situations, then it is not right for any specific situation. Ask yourself, "If we adopted this rule in every case, could the organization, or society, survive?"
- **Slippery Slope:** If an action cannot be taken repeatedly, then it is not right to take at all. An action may appear to work in one instance to solve a problem but, if repeated, would result in a negative outcome. This rule can also be stated as "Once started down a slippery path, you may not be able to stop."
- **Collective Utilitarian Principle:** Take the action that achieves the greater value for all of society. This rule assumes that you can prioritize values in a rank order and can understand the consequences of various courses of action.
- **Risk Aversion:** Take the action that produces the least harm, or the least potential cost. Some actions have extremely high failure costs of very low probability (e.g., building a nuclear generating facility in an urban area) or extremely high failure costs of moderate probability (speeding and automobile accidents). Avoid the high-failure-cost actions, and choose instead those actions whose consequences would not be catastrophic even if they were failures.
- **No Free Lunch:** Assume that virtually all tangible and intangible objects are owned by someone else unless there is a specific declaration otherwise. (This is the ethical "no free lunch" rule.) If something someone else has created is useful to you, it has value, and you should assume that the creator wants compensation for this work.
- **The *New York Times* Test (Perfect Information Rule):** Assume that the results of your decision on a matter will be the subject of the lead article in the *New York Times* the next day. Will the reaction of readers be positive or negative? Would your parents, friends, and children be proud of your decision? Most criminals and unethical actors assume imperfect information and, therefore, that their decisions and actions will never be revealed. When making decisions involving ethical dilemmas, it is wise to assume perfect information markets.
- **The Social Contract Rule:** Would you like to live in a society in which the principle you are supporting would become an organizing principle of the entire society? For instance, you might think it is wonderful to download illegal copies of Hollywood movies, but you might not want to live in a society that does not respect property rights, such as your property rights to the car in your driveway.

None of these rules is an absolute guide, and there are exceptions and logical difficulties with all of them. Nevertheless, actions that do not easily pass these guidelines deserve some very close attention and a great deal of caution because the appearance of unethical behavior may do as much harm to you and your company as the actual behavior.

Now that you have an understanding of some basic ethical reasoning concepts, let's take a closer look at each of the major types of ethical, social, and political debates that have arisen in e-commerce.

8.2 PRIVACY AND INFORMATION RIGHTS

Privacy is one of the most complex ethical issues raised by the Internet and e-commerce. The Internet, mobile devices, and other digital technologies have become the primary means of personal interaction and are now at the center of social, political, and business life. These technologies efficiently and faithfully record human behavior in ways never imagined. How can we square the ever-growing power of these digital technologies with the notion that individuals have the right to be left alone, to be free to think what they want without fear, and to be able to control how their information is used? Laws and regulations that govern the use of this information are weak and poorly defined. As a result, consumers often feel that they have lost control over their personal information online. And, indeed, they have.

WHAT IS PRIVACY?

privacy
the moral right of individuals to be left alone, free from surveillance or interference from other individuals or organizations, including the state

information privacy
subset of privacy that rests on four central premises, including the moral rights to control the use of information collected and to know whether information is being collected, the right to personal information due process, and the right to have personal information stored in a secure manner

right to be forgotten
the claim of individuals to be able to edit and delete personal information

Privacy is the moral right of individuals to be left alone, free from surveillance or interference from other individuals or organizations, including the state. Privacy is one girder supporting freedom. Without the privacy required to think, write, plan, and associate independently and without fear, social and political freedom, particularly freedom of expression, is weakened—and perhaps destroyed.

Information privacy is a subset of privacy that rests on four central premises. First, individuals have a moral right to be able to control the use of whatever information is collected about them, whether or not they consented to the gathering of that information in the first place. Individuals should be able to edit, delete, and shape the use of their online personal information by governments and business firms. In this view, individuals even have the "**right to be forgotten**," as discussed in the opening case.

Second, individuals have a moral right to know when information is being collected about them and must give their consent prior to the collection of their personal information. This is the principle of "informed consent."

Third, individuals have a right to personal information due process. The process of collecting, sharing, and disseminating personal information must be "fair" and transparent to everyone. Systems of personal information—whether public or private—must be publicly known (no secret systems), must operate according to a published set of rules (terms of use policies) that describe how governments and firms will use personal information, and must define ways in which people can edit, correct, and shape their personal information in a system of records.

Fourth, individuals have a right to have their personal information stored in a secure manner. Personal record systems must have procedures in place to protect personal information from intrusion, hacking, and unauthorized uses. It is important to note that although privacy and security are not the same, they are linked. Without security of personal information, there obviously cannot be privacy.

These principles of personal information privacy are reflected in a doctrine called Fair Information Practices (FIP), established by the Federal Trade Commission (FTC) (see **Table 8.2**). We further discuss the role of the FTC in protecting personal private information later in the chapter.

TABLE 8.2 THE FTC'S FAIR INFORMATION PRACTICES PRINCIPLES

Notice/Awareness (core principle)	Sites must disclose their information practices before collecting data. Includes identification of collector, uses of data, other recipients of data, nature of collection (active/inactive), voluntary or required, consequences of refusal, and steps taken to protect confidentiality, integrity, and quality of the data.
Choice/Consent (core principle)	There must be a process in place that allows consumers to choose how their information will be used for secondary purposes other than supporting the transaction, including internal use and transfer to third parties. Opt-in/opt-out must be available.
Access/Participation	Consumers should be able to review and contest the accuracy and completeness of data collected about them in a timely, inexpensive process.
Security	Data collectors must take reasonable steps to ensure that consumer information is accurate and secure from unauthorized use.
Enforcement	There must be a mechanism in place that enforces FIP principles. This mechanism can involve self-regulation, legislation giving consumers legal remedies for violations, or federal statutes and regulations.

SOURCE: Based on data from Federal Trade Commission, 1998, 2000.

PRIVACY IN THE PUBLIC SECTOR: PRIVACY RIGHTS OF CITIZENS

The concept and practice of privacy, and its legal foundation, are very different in the public sector versus the private sector. In the public sector, concepts of privacy have a long history that has evolved over two centuries of court rulings, laws, and regulations in the United States and Europe. In the private sector, concepts of privacy are much more recent and, in the age of the Internet, are in a state of flux, debate, and argument.

In the United States, claims to individual privacy in the public sector are embedded in the Constitution and the Bill of Rights. The First Amendment guarantees citizens freedom of speech, association, and religion and prohibits Congress from passing any laws that challenge these rights. The Fourth Amendment prohibits government agents from conducting unreasonable searches and seizures of a citizen's premises and requires a court-sanctioned warrant based on probable cause prior to any search of a person's premises. Much later, the Fourth Amendment was extended beyond the home to a very limited set of physical places. The Fourteenth Amendment prohibits states from passing laws that deprive persons of life, liberty, or property, which the courts have interpreted as protecting the privacy of personal behavior in the home.

The word "privacy" is not mentioned in these founding documents, but it is considered to be necessary (implicit) for these amendments to mean anything. If privacy is denied, then freedom of speech, association, and religion is not possible. If one's premises cannot be protected against unreasonable searches by government, then there is no privacy.

However, relying on court decisions involving the Constitution to protect individuals has turned out to be inadequate in modern times. The founding documents of the eighteenth century did not define the rights of individuals to their personal information collected by government agencies in the routine course of administration or the rights of citizens to obtain documents created by government agencies. In 1974, Congress passed the Privacy Act, which for the first time defined the privacy rights of a citizen vis-à-vis federal government record systems. The Privacy Act regulates the collection and use of data collected by federal agencies and defines the fair information practices applicable to federal government systems, such as those created by the Internal Revenue Service and the Social Security Administration. It's important to remember that Privacy Act protections apply only to government intrusions on privacy, not to private firms' collection and use of personal information.

In addition to the Privacy Act, there are a host of other federal laws (and state laws) that protect individuals against unreasonable government intrusions (see **Table 8.3** for a list of federal privacy laws that apply to the U.S. government). These statutes attempt to implement Fair Information Practices in a wide variety of public systems that use personal information.

PRIVACY IN THE PRIVATE SECTOR: PRIVACY RIGHTS OF CONSUMERS

When the first large-scale, nationwide computerized systems began to appear in the United States in the 1960s, privacy issues and claims rose. For instance, credit cards gave retail merchants and financial institutions the ability to systematically collect digital

TABLE 8.3 FEDERAL PRIVACY LAWS APPLICABLE TO THE U.S. GOVERNMENT

NAME	DESCRIPTION
Freedom of Information Act	Gives people the right to inspect information about themselves in government files; also gives people and organizations the right to request disclosure of government records based on the public's right to know.
Privacy Act, as amended	Regulates the federal government's collection, use, and disclosure of data. Gives people a right to inspect and correct records.
Electronic Communications Privacy Act	Restricts unauthorized government access to private electronic communications.
Computer Matching and Privacy Protection Act	Regulates computerized matching of files held by different government agencies.
Driver's Privacy Protection Act	Limits access to personal information maintained by state motor vehicle departments to those with legitimate business purposes. Also gives drivers the option to prevent disclosure of driver's license information to marketers and the general public.
E-Government Act	Regulates the collection and use of personal information by federal agencies.
USA Freedom Act	Imposes limits on the bulk collection of U.S. citizens' telecommunications metadata.

information on consumer behavior. Large national private credit rating agencies appeared and began developing consumer credit histories, with details on personal finances, from credit cards to loan payments. These developments led to the first efforts to claim a right to consumer privacy. Other institutions within the education, health, and financial services sectors also began creating very large-scale databases involving millions of citizens. There followed a host of federal laws that applied to specific industries (see **Table 8.4**). This has been the pattern in the United States. Although many general consumer data privacy bills have been introduced in Congress through the years, none of them has passed. Instead, Congress has developed privacy statutes piecemeal, one industry at a time, as abuses become known. It has been the states that have been at the forefront of consumer data privacy–related legislation, and California, in particular, has led the way.

The California Online Privacy Protection Act, enacted in 2003, was the first state law requiring commercial websites to include a privacy policy. The California Consumer Privacy Act (CCPA), which went into full force and effect in 2020, is a landmark privacy law that gives consumers in California significant control over how certain businesses collect and handle their personal information. The CCPA was further strengthened with

TABLE 8.4 FEDERAL PRIVACY LAWS AFFECTING PRIVATE INSTITUTIONS

NAME	DESCRIPTION
Fair Credit Reporting Act	Regulates the credit investigating and reporting industry. Gives people the right to inspect credit records if they have been denied credit and provides procedures for correcting information.
Family Educational Rights and Privacy Act	Requires educational institutions to give students and their parents access to student records and to allow them to challenge and correct information; limits disclosure of such records to third parties.
Right to Financial Privacy Act	Regulates the financial industry's use of personal financial records; establishes procedures that federal agencies must follow to gain access to such records.
Cable Communications Policy Act	Regulates the cable industry's collection and disclosure of information concerning subscribers.
Video Privacy Protection Act	Prevents disclosure of a person's video rental records without court order or consent.
Children's Online Privacy Protection Act	Prohibits deceptive practices in connection with the collection, use, and/or disclosure on the Internet of personal information from and about children.
Telephone Consumer Protection Act	Regulates telemarketing messages delivered via text, mobile app, or other forms of wireless communication to a mobile device. Requires consumers' prior express consent to receive such messages.
Health Insurance Portability and Accountability Act	Requires health care providers and insurers and other third parties to promulgate privacy policies to consumers and establishes due process procedures.
Financial Services Modernization Act (Gramm-Leach-Bliley Act)	Requires financial institutions to inform consumers of the institutions' privacy policies and permits consumers some control over their own records.

the passage of the California Privacy Rights and Enforcement Act (CPRA), which goes into effect in January 2023. Together, the CCPA and CPRA give California residents the rights to be informed about the kind of personal information collected about them; to delete information ("right to be forgotten"); to opt out of the sale of their information; and to transfer the information to another service. The CPRA also establishes the California Privacy Protection Agency, a government agency for the enforcement of California's data privacy laws. The California Age-Appropriate Design Code Act, which will go into effect in 2024, requires online services likely to be used by minors to protect their privacy and safety by design and default. Although the California statutes technically apply only to California residents, their impact extends well beyond California's borders and applies to all companies that process data belonging to citizens of California. Virginia, Colorado, and Connecticut have also enacted comprehensive consumer data privacy laws, and a number of other states are considering doing so as well (Singer, 2022; Healey, 2021; Holland, 2021).

Information Collected by E-commerce Companies

Although there is a very long history with respect to the protection of privacy in the public sector and a more recent history of applying these ideas to certain private industries, the same is not true with respect to consumer privacy in public markets. From the time of village markets in ancient villages to the present day, there rarely has been a claim to privacy in public, open markets. Merchants in public markets historically have collected personal information. "Knowing your customer" meant knowing the name, personal preferences, interests, purchases, and backgrounds of consumers. Consumer behavior in public markets was not protected by either the common law or by documents such as the Constitution.

However, today the business environment has vastly changed from what it was like in the pre-Internet era. Amazon dominates online retail and has more than 300 million active customer accounts. Google's various websites attract around 260 million monthly visitors in the United States and enable Google to collect very detailed data on consumer intentions and interests. Meta has become a repository of data about the social lives of billions of people. The emergence of the Internet, the Web, and mobile devices has made it possible for online companies to gather huge amounts of digital consumer data, to use it for their own commercial purposes, and to potentially abuse that information. The Internet, the Web, and the mobile platform unfortunately provide an ideal environment for the invasion of the personal privacy of millions of consumers on a scale unprecedented in history. Perhaps no other recent issue has raised as much widespread social and political concern.

personally identifiable information (PII) any data that can be used to identify, locate, or contact an individual

anonymous information demographic and behavioral information that doesn't include any personal identifiers

Let's now look in a bit more detail at the variety of information that e-commerce companies routinely collect from or about consumers who visit and/or make purchases at their websites or mobile apps. Some of this data constitutes **personally identifiable information (PII)**, which is defined as any data that can be used to identify, locate, or contact an individual (Federal Trade Commission, 2000). Other data is **anonymous information** in which the identity of the person is not a name but an assigned code. This anonymous information includes demographic and behavioral information, such as age, occupation, income, zip code, ethnicity, and browsing behavior, but does not identify who you are. **Table 8.5** lists some of the personal identifiers that may be

TABLE 8.5 PERSONAL INFORMATION COLLECTED BY E-COMMERCE SITES

Name	Gender	Education
Address	Age	Preference data
Phone number	Occupation	Transaction data
E-mail address	Location	Clickstream data
Social security number	Location history	Device used for access
Bank account numbers	Likes	Browser type
Credit card numbers	Photograph	

collected by e-commerce companies. This is not an exhaustive list, and, in fact, many online companies collect hundreds of different data points on visitors. Although technically anonymous, this detailed information is still "personal," and researchers have shown that a name identifier can be attached to the information quite easily.

Table 8.6 identifies some of the major ways that online firms gather information about consumers.

According to a recent survey, more than 85% of consumers are concerned about their online privacy, with most believing they have lost control over their online information and are unable to effectively protect their data. High on the list of public concerns are profiling (and the use of profiles to target ads), social network privacy, sharing of information by marketers, mobile device privacy, and privacy issues associated with devices such as the Amazon Echo. Most consumers do not trust private firms or governments to protect their information, and almost 50% have opted out of using a product or service because of privacy concerns. Research has found that most people (more than 80%) do not accept the trade-off of the loss of their privacy in return for market efficiency or other benefits and believe the potential risks of data collection about them outweigh the benefits (Cisco, 2021; Pew Research Center, 2019).

Marketing: Profiling, Behavioral Targeting, and Retargeting

Around 300 million people in the United States regularly go online. Marketers would like to know who these people are, what they are interested in, where they are, what they are doing, and what they buy. The more precise and complete this information, the more valuable it is as a predictive and marketing tool. Armed with this information, marketers can make their ad campaigns more efficient by targeting specific ads at specific groups or individuals, and they can even adjust the ads for specific groups.

In the past, most web browsers and websites allowed third parties—including online advertising networks such as Google Marketing Platform, Microsoft Advertising, Meta's Audience Network, and others—to place "third-party" tracking software such as cookies and web beacons on a visitor's computer in order to engage in profiling the user's behavior across thousands of other websites that are also members of the advertising network. **Profiling** is the creation of **data images** (a collection of data records used to create behavioral profiles of consumers) that characterize online individual and group behavior. **Anonymous profiles** identify people as belonging to highly specific and targeted groups, for example, 20-to-30-year-old males who have college degrees

profiling
the creation of digital images that characterize online individual and group behavior

data image
collection of data records used to create behavioral profiles of consumers

anonymous profiles
identify people as belonging to highly specific and targeted groups

TABLE 8.6 MAJOR ONLINE INFORMATION-GATHERING TOOLS AND THEIR IMPACT ON PRIVACY

INTERNET CAPABILITY	IMPACT ON PRIVACY
Smartphones and apps	Used to track location and share photos, addresses, phone numbers, searches, and other behaviors to marketers.
Advertising networks	Used to track individuals as they move among thousands of websites. Likely to be impacted by the forthcoming phase-out of third-party web trackers.
Social networks	Used to gather information on user-provided content such as books, music, friends, and other interests, preferences, and lifestyles.
First-party cookies	Used to track individuals at a single site. Store user activity while on the website and enable login, shopping carts, understanding user behavior, and navigation features.
Third-party web trackers (cookies and beacons)	Placed by advertising networks and data collection firms with the permission of the website being visited. Used to track online behavior, searches, and sites visited across thousands of sites for the purpose of displaying "relevant" advertising. Slowly being phased out in response to consumer backlash regarding privacy invasion.
Persistent cookies	Remain active after a browsing session and stay active for a set period of time; useful in retargeting ads and cross-site tracking.
Device fingerprinting	Programs based on third-party servers that uniquely identify a device based on its operating system, local network, browser, graphics chip, graphics driver, installed fonts, and other features.
Search engine behavioral targeting	Uses prior search history, demographics, expressed interests, location, or other user-entered data to target advertising.
Deep packet inspection	Uses software installed at the ISP level to track all user clickstream behavior.
Shopping carts	Used to collect detailed payment and purchase information.
Forms	Online forms that users voluntarily fill out in return for a promised benefit or reward that are linked with clickstream or other behavioral data to create a personal profile.
Site transaction logs	Used to collect and analyze detailed information on page content viewed by users.
Search engines	Used to trace user statements and views on newsgroups, chat groups, and other public forums on the Web and to profile users' social and political views. Google returns name, address, and links to a map with directions to the address when a phone number is entered.
IP address	The unique number assigned to every device on the Internet, which is revealed by users when they use the Internet. Used to identify the ISP provider, region, local area network IP, and potentially the individual device. With a few other pieces of information, individuals are easily identified. Used by law enforcement, telecommunications companies, and ad firms to trace communications and user behavior across the Internet.
Cross-device tracking	Integrates the login information on smartphones with browser tracking from websites to create an integrated file on specific users; shared with ad network firms.

and incomes greater than $50,000 a year and who are interested in high-end sneakers (based on recent search engine use). **Personal profiles** add a personal e-mail address, postal address, and/or phone number to behavioral data. Increasingly, online firms are linking their online profiles to personal offline consumer data collected by database firms that track credit card purchases as well as to established retail and catalog firms. We have already discussed some of the privacy issues associated with online marketing in Chapter 6, where we reviewed behavioral targeting (interest-based advertising), retargeting (remarketing), and the use of advertising networks. We also reviewed the privacy implications of various online marketing technologies, such as the use of third-party tracking files and efforts to phase out the use of third-party trackers and to replace them with more privacy-regarding marketing methods. We will further discuss technological solutions to online privacy concerns later in the chapter.

personal profiles add a personal e-mail address, postal address, and/or phone number to behavioral data

Facial recognition adds a new dimension to profiling and behavioral targeting. Originally developed as a tool to recognize terrorists, local police departments have widely adopted the technology to identify wanted persons, finding that it more quickly identifies such people than do fingerprint databases. However, studies have found that the algorithms used by various facial recognition systems exhibited differential false-positive rates (i.e., identifying a match when, in fact, there is none) based on race, ethnicity and gender, creating concerns about embedded bias (National Institute of Standards and Technology, 2019). As a result, a number of tech companies, such as Microsoft and Amazon, have put a hold on the sale of their technologies to law enforcement agencies, although many facial recognition systems remain in the market (Hale, 2020).

Facial recognition technology is not used just by law enforcement. A number of commercial uses are already commonplace, particularly in biometric security applications (see the Chapter 5 *Insight on Business* case, *Are Biometrics the Solution for E-commerce Security?*). Massive databases of people's faces collected from social networks, photo websites, dating services, and cameras placed in public spaces are being compiled by a number of companies as well as by academic researchers. Georgetown University has estimated that photos of nearly half of all U.S. adults have been entered into at least one facial recognition database. Tech giants like Meta (Facebook and Instagram) and Google are reputed to have amassed the largest facial data sets. Both have faced lawsuits on the grounds that doing so violates the Illinois Biometric Information Privacy Act, one of a growing number of state laws that address this issue and which require firms to obtain user consent before collecting biometric and facial information. Google recently agreed to settle such a suit with respect to its collection and use of photos uploaded by users to Google Photos, while Meta recently agreed to pay $650 million to settle a similar suit. In November 2021, Meta announced that it would stop using DeepFace, its artificial intelligence facial recognition algorithm for photo tagging, on the Facebook platform, although it said that it would continue to explore the use of the technology in connection with its initiative to build its emerging metaverse (Fingas, 2022; Heilweil, 2021).

Mobile Devices: Privacy Issues

As the mobile platform becomes more and more important, mobile and location-based privacy issues are also becoming a major concern. In addition to being able to track and store user location, mobile devices and associated apps are storehouses of personal

information that can be shared with third parties such as advertisers and app developers, often without the awareness of the user.

Let's consider smartphone cross-device tracking and its marriage to cross-site web data. Smartphones are tracking devices by design. Telecommunications companies and smartphone operating systems need to know where you are, and your phone is continually connecting to nearby cell towers. Apple's iOS keeps cell location information encrypted on the user's phone, whereas Android reports this information to its servers. Users usually share this information with apps, such as Uber, when they sign up for the app. Smartphone operating systems (Apple and Android) assign an anonymized ad tracking numbers to all users, and these numbers can be used to target specific users. Apple's iOS allows users to reset this number, but doing so is not easy or well known. Smartphones do not use cookies, but apps are able to identify users whenever they log in to the app using the phones. These apps may share this information with partner advertising platforms, which correlate the ID of the user with browser information collected from the same user at various websites. The result is a **cross-device graph**, a data file that combines tracking data from all devices an individual uses into a single comprehensive user profile.

cross-device graph
a data file that combines tracking data from all devices an individual uses into a single comprehensive user profile

persistent location tracking
the ability to track the geo-location of phone users whether they are using location-tracking apps or not

Smartphone and app technology also enables **persistent location tracking**, or the ability to track the geo-location of phone users whether they are using location-tracking apps or not. Even when apps are not activated, they may be sending location data to a variety of servers. Apps are major enablers of location-tracking data, which can then be sold to advertisers. Users can use options in the phone's operating system to not share location information (location services) with apps, but whatever information apps collect from their users is subject only to the apps' own privacy policies. Some apps, like Google Maps, will not operate without location services turned on. The default option for most apps is to permit location reporting, and most users accept this option when signing up for the app. Apple has reacted to consumer concern about mobile app cross-device and location tracking by updating the iOS mobile device operating system to make privacy issues with respect to apps more visible and Google recently has followed suit. The *Insight on Technology* case, *Apps that Track*, takes a more in-depth look at some of these issues.

Social Networks: Privacy and Self Revelation

Social networks pose a unique challenge for the maintenance of personal privacy because they encourage people to reveal details about their personal lives (passions, loves, favorites, photos, videos, and personal interests) and to share them with their friends. In return, users get access to a free social network service. Social networks have greatly enlarged the depth, scope, and richness of information collected by private corporations. Although Google's search engine is a massive database of personal intentions, Meta has created a massive database of information about Facebook's and Instagram's users, including their friends, preferences, Likes, posts, photos, and videos. Some social network users share these personal details with everyone on the social network. On the face of it, this would seem to indicate that people who participate in social networks voluntarily give up their rights to personal privacy. How could they claim an expectation of privacy? When everything is shared, what's private?

INSIGHT ON TECHNOLOGY

APPS THAT TRACK: A DOUBLE-EDGED SWORD

How often do you check your local weather forecast? If you're like many people, you might do so multiple times a day, probably by opening a weather app on a mobile device. But did you stop to think about the fact that your weather app is likely also recording your exact physical location each time you check the weather? Few realize that the simple act of checking the local weather forecast can open the door to the widespread sale of that data to third parties, who can then use it for purposes far removed from the function of the app that originally gathered the data. And it's not just weather apps that collect and sell this kind of data. Location data forms the basis of a multibillion-dollar industry that is populated by largely unregulated companies that operate behind the scenes. For instance, one such company, Mobilewalla, has said that it has data from 75,000 mobile apps and 1.6 billion devices across more than 35 countries.

To figure out where you are, mobile devices use data from a variety of technologies embedded within the device, such as GPS sensors, Bluetooth, and connections to local Wi-Fi and cellular networks. Mobile apps often make use of a third-party SDK (software development kit) such as Foursquare's Pilgrim SDK, a free software tool that enables an app to collect data or may be paid by an SDK developer to include its code within an app.

Apple's iOS 14.5 update, released at the end of April 2021, aims to make privacy issues related to apps more visible. If an app uses an SDK, the developer must describe what data the SDK collects and how the data may be used. Apps must now ask for your permission before tracking your activity (including your physical location). Google instituted similar policies in February 2022. However, many users are so conditioned to clicking "Yes" that they don't stop to consider the ramifications. In addition, some app developers employ "dark patterns," a design tactic that prompts you to make a choice detrimental to your own interests—for example, by prompting you to enable location tracking while simultaneously suggesting that the app might not work as intended if the tracking is not enabled. As a case in point, contrary to what many people assume, weather apps do not actually "need" to take constant readings of location data to provide a local weather forecast; but these apps do not necessarily make that fact apparent.

After you agree to tracking, the app will typically refer you to a privacy policy that details how that data can be used. Research has shown that few users ever actually read such policies or understand their ramifications. Companies that sell user data often justify that doing so provides them with a necessary revenue stream. For example, AccuWeather's privacy policy notes that its ability to provide its app for free is supported by its sale of user information to third parties. Companies that sell user data also note that the information collected is usually anonymized (although studies have shown that it can be relatively easy to tie such data to a particular person). Companies that buy data may also be doing so for a variety of legitimate reasons, such as for analytics, fraud detection, and advertising and marketing purposes.

You might not object to your data being used to provide you with relevant advertising. However, it's what happens to that data when it is in the hands of a data broker that is of concern. Currently, there are few laws or regulations in the United States that restrict what a data broker can do with that data. After that data has been

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collected, it can be sold over and over again. For instance, location data collected by Mobilewalla was ultimately acquired by a company named Venntel, which then sold the data to various U.S. government agencies, such as the IRS, DEA, FBI, DHS, and ICE. In September 2022, the Electronic Freedom Frontier, a privacy advocacy group, reported that a firm named Fog Data Science was selling a service to local police departments throughout the United States that purportedly can identify where a person was at any point in time over the past several years, based on data collected from thousands of common Android and iOS apps. Although the U.S. Supreme Court has ruled that the government needs a warrant to compel companies such as cellphone carriers to provide location data, no such restriction applies to the government's purchase of such data from data brokers. Government agencies that use such data have defended the practice, saying the data is widely available commercially and aids them in pursuing their responsibilities to the public.

Highlighting this issue, in March 2022, researchers discovered that a Panamanian company reportedly linked to a U.S.-based defense contractor had paid developers to incorporate an SDK that violated Google's rules on collecting user data. App developers were told that the SDK would collect non-personal data on behalf of ISPs and financial service and energy companies. However, in reality, the SDK harvested data about users' precise locations, e-mail addresses, phone numbers, and nearby computers and mobile devices. The SDK was included in a number of consumer apps, such as weather apps, QR code scanners, highway radar detectors, and religious prayer apps, that together were downloaded on at least 60 million Android devices. Google has banned the SDK and removed the apps from the Google Play store, but that action doesn't prevent the SDK's ability to continue gathering data from apps that are already installed.

In January 2022, the Attorney General for the District of Columbia sued Google, alleging that Google violated the District of Columbia's consumer protection laws by misleading consumers about the collection and use of location data. Attorney generals in Arizona, Texas, Indiana, and Washington are also suing Google on similar grounds. Similarly, in August 2022, the Federal Trade Commission filed a lawsuit against data broker Kochava, alleging that the company sold geo-location data from millions of mobile devices that could be used to trace people to sensitive locations, such as addiction recovery or medical facilities. The FTC indicated that it will be taking a tougher stance on the use of consumer geo-location data, particularly such data being generated by health-related mobile apps. According to the FTC, the combination of location data and health data creates a new frontier of potential harm to consumers.

Kochava is defending the suit in part by arguing that the FTC has not issued any specific regulations prohibiting such practices and that, even if injury to consumers did occur, consumers should have expected that their location data, even with respect to locations that could be considered sensitive, would be shared.

SOURCES: "Data Broker Helps Police See Everywhere You've Been with the Click of a Mouse: EFF Investigation," Eff.org, September 1, 2022; "D.C. AG Can Proceed with Location Privacy Case Against Google," by Wendy Davis, Mediapost.com, September 1, 2022; "FTC Sues Idaho Company for Selling Sensitive Tracking Data," by John McKinnon and Patience Haggin, *Wall Street Journal*, August 29, 2022; "FTC Sues Kochava Over Location Data," by Wendy Davis, Mediapost.com, August 29, 2022; "Apps with Hidden Data-Harvesting Software Are Banned by Google," by Byron Tau and Robert McMillan, *Wall Street Journal*, April 5, 2022; "State Laws Shift Geolocation's Spot on the Privacy Map," by Womble Bond Dickinson, Jdsupra.com, March 9, 2022; "Who Is Policing the Location Data Industry," by Alfred Ng and Jon Keegan, themarkup.org, February 24, 2022; "Google Wants to Bring Its Privacy Sandbox to Android," by Frederic Lardinois, Techcrunch.com, February 16, 2022; "Google Sued Over Deceptive Location Tracking," by Malwarebytes Lab, Blog.malwarebytes.com, January 26, 2022; "How Cellphone Data Collected for Advertising Landed at U.S. Government Agencies," by Byron Tau, *Wall Street Journal*, November 18, 2021; "There's a Multibillion-Dollar Market for Your Phone's Location Data," by Jon Keegan and Alfred Ng, Themarkup.com, September 30, 2021; "We Checked 250 iPhone Apps—This Is How They're Tracking You," by Thorin Klosowksi, *New York Times*, May 6, 2021; "The Government Can't Seize Your Digital Data, Except by Buying It," by Elizabeth Goitein, *Washington Post*, April 26, 2021.

But the reality is that many participants in social networks have a very keen sense of their personal privacy. Meta is a prime example of senior management pushing the envelope of privacy and, as a result, experiencing a number of public relations reversals, intense critical reaction, and growing government concern. For a review of Meta's various positions on online privacy over the years and public and congressional reactions to these issues, refer to the *Insight on Society* case, *Facebook and the Age of Privacy*, in Chapter 1.

The result of these public conflicts suggests that social network participants do indeed have a strong expectation of privacy in the sense that they want to control how "their" information is used. People who contribute user-generated content have a strong sense of ownership with respect to that content, which is not diminished by posting the information on a social network for one's friends. As for users who post information that is viewable by anyone, not just friends, those posts can be seen as "public performances" in which the contributors voluntarily publish their performances, just as writers or other artists do. In such situations, any claim to privacy with respect to the post is diminished.

Consumer Privacy Regulation and Enforcement: The Federal Trade Commission (FTC)

In the United States, the FTC has taken the lead with respect to consumer privacy, conducting research, recommending legislation to Congress, and enforcing existing privacy legislation and regulations by filing complaints and lawsuits against businesses that it believes are in violation. The FTC can levy fines and also impose a federal monitor or reporting system to ensure that a firm complies with agency rulings.

Earlier in this section we described the FTC's Fair Information Practices (FIP) principles (see Table 8.2), on which the FTC bases its assessments of how well firms are protecting consumer privacy. The FTC's FIP principles set the ground rules for what constitutes due process privacy protection procedures at e-commerce and all other websites—including government and nonprofit websites—in the United States. Embedded within FIP principles is the concept of **informed consent** (defined as consent given with knowledge of all material facts needed to make a rational decision). There are traditionally two models of informed consent: opt-out and opt-in. In the **opt-out model**, the default is to collect information unless the consumer takes affirmative action to prevent the collection of data, such as by checking a box or by filling out a form. The **opt-in model** requires an affirmative action by the consumer to allow collection and use of information. Consumers are directed to check a box if they agree to allow their data to be collected and used. Otherwise, the default is not to allow the collection of the user's data. Many websites now employ "cookie banners"—a pop-up window that allows users to accept or reject cookies from the site. Although intended as a form of opt-in informed consent, most privacy advocates feel that cookie banners are ineffective because few people actually read the disclosures about what data is being collected before clicking the Accept button.

informed consent
consent given with knowledge of all material facts needed to make a rational decision

opt-out model
the default is to collect information unless the consumer takes affirmative action to prevent the collection of data

opt-in model
requires an affirmative action by the consumer to allow collection and use of consumer information

The FTC's FIP principles are guidelines, not laws. In the United States, for example, businesses can gather transaction information generated in the marketplace and then use that information for other purposes without obtaining the explicit affirmative informed consent of the individual. In Europe, doing so would be illegal. A business

in Europe cannot use marketplace transaction information for any purpose other than supporting the current transaction unless the business obtains the individual's consent in writing or the individual fills out an on-screen form allowing the use of the information.

However, the FTC's FIP guidelines are often used as the basis of legislation. The most important online privacy legislation to date that has been directly influenced by the FTC's FIP principles is the Children's Online Privacy Protection Act (COPPA) (1998), which requires websites to obtain parental permission before collecting information on children younger than 13 years of age (see the Chapter 7 *Insight on Society* case, *Marketing to Children in the Age of Social, Local, Mobile*).

In the last decade, the FTC has broadened its approach to privacy to include a harm-based approach, which focuses on practices that are likely to cause harm or unwarranted intrusion in consumers' daily lives. In several reports, the FTC has recognized the limitations of its earlier FIP approach. It has found that "informed consent" is not effective when consumers do not know about, or understand, online firms' data collection practices. Online firms often change their privacy policies without notice, and these policies are often written in obscure language that confuses consumers. The FTC has also found the distinction between personal information and anonymous information to be invalid because it is easy for firms to identify consumers personally by name, e-mail, and address based on so-called anonymous data. As a result, the FTC developed a new framework to address consumer privacy. The FTC's most recent emphasis is not on restricting the collection of information (as in previous eras of privacy regulation) but is instead on giving consumers rights with respect to the information collected about them and that information's use. This is called a "consumer rights–based" privacy policy and represents a change in the meaning of privacy from "Leave me alone" to "I want to know and control how my personal information is being used." **Table 8.7** summarizes the important aspects of this framework. In August 2022, the FTC began the process of considering whether it should implement new regulations with respect to "commercial surveillance", which it defined as the business of collecting, analyzing, and profiting from information about people (Federal Trade Commission).

A common misperception is that no one is doing anything about the online invasion of privacy. Yet over the last two decades, the FTC has brought more than 210 enforcement actions against firms involving a variety of privacy issues, including spam, social media, behavioral advertising, spyware, peer-to-peer file sharing, and mobile devices. Recent enforcement actions include a $5 billion fine levied against Facebook; a settlement with Zoom Communications with respect to Zoom's misrepresentations about its privacy and security practices; and a $170 million fine levied against Google and YouTube for alleged violations of COPPA (Federal Trade Commission, 2021).

The FTC also exerts influence on the online arena by acting as the lead federal agency in updating privacy principles and policies as new technologies and business practices emerge. Various reports have focused on industry best practices with respect to the data broker industry, behavioral targeting, cross-device tracking, student privacy and education technology, the changing nature of identity theft, the Internet of Things (IoT), connected cars, and mobile health apps, among other topics (Federal Trade Commission, 2021, 2020).

TABLE 8.7 THE FTC'S CURRENT PRIVACY FRAMEWORK

PRINCIPLE	APPLICATION
Scope	Applies to all commercial entities that collect or use consumer data; not limited to those that collect just PII.
Privacy by Design	Companies should promote consumer privacy throughout the organization and at every stage of development of products and services: • Data security • Reasonable collection limits • Reasonable and appropriate data retention policies • Data accuracy • Comprehensive data management procedures
Simplified Choice	Companies should simplify consumer choice. They need not provide choice before collecting and using data for commonly accepted practices: • Product and fulfillment • Internal operations, fraud prevention • Legal compliance • First-party marketing For all other commercial data collection and use, consumer choice is required and should be clearly and conspicuously offered at a time and in a context in which the consumer is providing data. Some types of information or practices (concerning children, financial and medical information, deep packet inspection) may require additional protection through enhanced consent. Special choice mechanism for online behavioral advertising: "Do Not Track."
Greater Transparency	Increase transparency of data practices by: • Making privacy notices clearer, shorter, and more standardized to enable better comprehension and comparison • Providing consumers with reasonable access to data about themselves • Providing prominent disclosures and obtaining express affirmative consent before using consumer data in a materially different manner than claimed when data was collected • Educating consumers about commercial data privacy practices

SOURCE: Based on data from Federal Trade Commission, 2010.

Privacy and Terms of Use Policies

As noted previously, one conceptual basis of U.S. privacy law is notification and consent. It is assumed that consumers can read Terms of Use notices (or privacy policies) concerning how a website will use their personal information and then can make a rational choice to consent to the terms of use, opt out of the data collection (if that is an option), or stop using the site. Until recently, many U.S. e-commerce companies rejected the concept of informed consent and instead simply published their information use policy on their site. Nearly all websites have Terms of Use policies that users can find if they look carefully. These Terms of Use policies are sometimes called privacy policies, and they describe how the firms will use information collected on their sites. These policies are notices, and as noted previously, it is assumed that anyone who uses the site has implicitly agreed to the Terms of Use policy. A study reviewed 30 popular social network and creative community websites and found that it would take the average reader about eight

hours to simply read the policy. Another study of privacy policies of 150 popular websites and apps characterized those policies as an "incomprehensible disaster." Obviously, a critical flaw with informed consent as the basis of privacy protections is that it assumes that the average user can understand what privacy they may be giving up by using a site (Litman-Navarro, 2019; Singer, 2014; Fiesler et al., 2014). U.S. businesses argue that informing consumers by publishing a terms of use policy is sufficient to establish the users' informed consent. Privacy advocates argue that many terms of use/privacy policy statements on U.S. websites are obscure and difficult to read and that they legitimate just about any use of personal information. In addition, even when consumers are prompted to actively agree to the terms and conditions of a company's privacy policy, research has shown that few consumers actually read the policy before agreeing to it and that even among those who say they do read it, only a small percentage said they read them all the way through (Pew Research Center, 2020a).

While politicians, privacy advocates, and the Internet industry wrangle over what the rules for privacy should be, very little attention has been paid to actually measuring the strength of privacy policies for individual companies, comparing the privacy policies of various companies to those of other companies, and understanding how privacy policies have changed over time at a specific company. Is Facebook's privacy policy worse than, better than, or about the same as Apple's, or Google's? Have privacy policies improved after 10 years of debate, or have they deteriorated?

A research project provides some preliminary answers to these questions. The researchers developed a measure of privacy policies by applying 10 privacy policy principles when reviewing policies (see **Table 8.8**) (Shore and Steinman, 2015). You will recognize these principles because they derive primarily in part from the FTC's FIP principles previously described. The dimensions themselves can be measured on a four-point scale from 0 to 4 (0 meaning the privacy policy fails to meet the criterion, and 4 indicating the criterion was fully achieved). You can use the principles in Table 8.8 as a way to measure the privacy policy of your own online business or that of another firm. You can measure a single firm at two points in time to see how its policies changed or compare two or more firms at a single point in time.

TABLE 8.8 CRITERIA TO USE WHEN EXAMINING PRIVACY POLICIES

- Can the privacy policy be easily found, reviewed, and understood by users?
- Does the privacy policy fully disclose how personal information will and will not be used by the organization? Is information about users ever shared or sold without users' explicit permission?
- Can users decide whether they want to allow their data to be collected and used?
- Can users decide and actively indicate that they agree to be profiled, tracked, or targeted?
- Can users decide how and whether their sensitive information is shared?
- Are users able to change any information that they input about themselves?
- Can users decide who can access their information?
- Are users notified promptly if their information is lost, stolen, or improperly accessed?
- Can users easily report concerns and get answers?
- Do users receive a copy of all disclosures of their information?

Privacy Protection in Europe: The General Data Protection Regulation (GDPR)

In 2018, the European Commission implemented the EU **General Data Protection Regulation (GDPR)**, an updated framework governing data protection in EU member countries that replaces the EU's previous Data Protection Directive. The GDPR is arguably the most important privacy legislation since the promulgation of the FTC's FIP principles. The GDPR applies to all firms and organizations that collect, store, or process the personal information of EU citizens, and its protections apply worldwide, regardless of where the processing of the information takes place (European Commission, 2018).

General Data Protection Regulation (GDPR)
updated framework governing data protection in EU member countries that replaces the Data Protection Directive

In Europe, privacy protection is historically much stronger than it is in the United States. In the United States, there is no federal agency charged with enforcing privacy laws, and there is no single privacy statute governing the private use of personally identifiable information (PII). Instead, as previously noted, privacy laws are piecemeal, sector by sector (e.g., medical privacy, educational privacy, and financial privacy laws). These laws are enforced by the FTC, by businesses' self-regulation, and by individuals, who must sue agencies or companies in court to recover damages. This process is expensive and rarely done.

In the European Union, data protection laws are comprehensive, apply to all organizations, and are actively enforced by data protection agencies in each country. The GDPR protects a wide variety of PII: basic identity information such as name, address, and ID numbers; web data such as location, IP address, cookie data, and RFID tags; health and genetic data; mobile phone number; driver's license and passport numbers; biometric and facial data; racial and ethnic data; political opinions; and sexual orientation.

The main objective of the GDPR is to strengthen the rights of citizens to their own personal information and to increase oversight of firms to ensure that they implement these individual rights. A second thrust is to harmonize conflicting data protection standards among the European nations that are members of the European Union and to create a single EU agency to implement and enforce the regulation. The third goal is to enforce the framework worldwide and apply it to all organizations that operate in the European Union or process data pertaining to EU citizens, regardless of where the organization is located.

The GDPR strengthens individual privacy rights by requiring organizations to allow consumers to access all their personal information without charge within one month and by providing users with the right to require that an organization delete their personal data (the right of erasure, also sometimes referred to as the right to be forgotten). The GDPR also ensures that consumers are not locked into a particular service (data portability) and gives consumers the right to sue providers for damages or abuse of PII, including class action lawsuits.

The responsibilities of organizations with respect to privacy have also been strengthened. Organizations must now have a data protection officer who reports to senior management. Explicit consent must be obtained from users before the organization can collect data (positive opt-in), eliminating default opt-in processes. Organizations must publish the rationale for data collection as well as the length of time that they retain data, and they must report any breaches and hacks within 72 hours. Organizations must also build privacy protections into all new systems (privacy by design) and limit targeting and retargeting of individuals to audience-level, anonymized data (rather than

targeting based on intimate, personal profiles). Organizations are also required to limit the collection of personal data to only what is needed to support a task or a transaction and then delete it shortly thereafter. Abuse of PII is subject to fines of up to $20 million or 4% of the organization's global revenue, whichever is greater.

privacy shield agreements
designed to ensure that EU data processed in non-EU nations meets GDPR standards

safe harbor agreements
private self-regulating policy and enforcement mechanism that meets the objectives of government regulators and legislation but does not involve government regulation or enforcement

Finally, the European Union has the ability to enforce the GDPR's requirements with non-EU countries like the United States via the use of inter-governmental **privacy shield agreements**, which are designed to ensure that EU data processed in non-EU nations meets GDPR standards. Privacy shield agreements are a more enforceable version of earlier **safe harbor agreements**, which provide a private self-regulating policy and enforcement mechanism that meets the objectives of government regulators and legislation but does not involve government regulation or enforcement. In 2020, the Court of Justice of the European Union invalidated the existing Privacy Shield between the European Union and the United States, ruling that the transfer of data to the United States exposed Europeans to U.S. government surveillance without providing sufficient rights for Europeans to challenge that surveillance, thereby violating the GDPR. In March 2022, the United States and the European Commission finally announced an agreement on a new Trans-Atlantic Data Privacy Framework, which replaces the previously invalidated Privacy Shield (The White House, 2022).

The GDPR is clearly aimed at Big Tech companies such as Amazon, Google, Meta, and Microsoft as well as other ad-based online businesses that build collections of personal data by tracking individuals and merging that data with other data from firms and data brokers in order to build comprehensive digital images (profiles) and to target these persons with ads. Although the GDPR has already had a significant impact (in 2021, regulators levied aggregate fines of more than 1 billion euros), there remain some issues with its implementation. A glut of early and complex GDPR complaints has led to a backlog at privacy regulators in various countries, particularly in Ireland, where many technology companies maintain their headquarters (Burgess, 2022; Thompson, 2022).

Industry Self-Regulation

Federal and state government regulation alone is insufficient to protect consumer privacy. The technology evolves quickly and provides marketers with more tools to collect and use consumer private information before legislatures and government agencies can respond. The online industry in the United States has historically opposed online privacy legislation, arguing that industry can do a better job of protecting privacy than the government can.

One industry approach has been the development of online "seals" that attest to a company's privacy policies. A number of nonprofit organizations, such as the Better Business Bureau (BBB), TrustArc (formerly TRUSTe), and WebTrust, have established this sort of online seal program. However, critics argue that such programs have not been particularly effective in safeguarding privacy.

The advertising network industry has also formed an industry association, the Network Advertising Initiative (NAI), to develop privacy policies. The NAI policies have two objectives: to offer consumers a chance to opt out of advertising network programs (including e-mail campaigns) and to provide consumers with redress from abuses. In order to opt out, the NAI has created a website—Networkadvertising.org—where consumers can use a global opt-out feature to prevent network advertising agencies from

placing their cookies on a user's computer. If a consumer has a complaint, the NAI has a link where complaints can be filed (Network Advertising Initiative, 2022).

The AdChoices program is another industry-sponsored initiative to encourage websites to be more transparent about how they use personal information and to make it more likely that appropriate ads are shown to users by asking the users themselves. An AdChoices icon appears next to ads and clicking on this icon provides more information and the opportunity to provide feedback to the advertiser.

A powerful form of corporate self-regulation is market and public pressure. When firms engage in behavior that is repugnant to consumers, the resulting social media firestorm is often enough to encourage firms to take corrective action, albeit often under the pressure of governmental investigations. For instance, Apple, Google, Meta, and other companies have developed a number of tools that allow users to set their privacy preferences and restrict the use of their information for interest-based advertising. Google, Apple, and most browser firms have also developed tools for individuals to use to limit the uses of their information. Millions of users do take advantage of these tools. Yet the larger majority does not because these tools are hard to find and even harder to understand. We discuss technological solutions to privacy concerns further in the next section.

In general, industry efforts at self-regulation in the area of online privacy have not succeeded in reducing fears of privacy invasion during online transactions or in reducing the level of privacy invasion. At best, self-regulation has offered consumers notice about whether a privacy policy exists but usually says little about the actual use of the information, does not offer consumers a chance to see and correct the information or to control its use in any significant way, offers no enforceable promises for the security of that information, and offers no enforcement mechanism.

Technological Solutions

A number of technological solutions have been developed to deal with the invasion of privacy on the Web and mobile platforms. As described earlier in this chapter and in Chapter 6, one essential threat to privacy is the tracking of users and recording their behavior on multiple sites (**cross-site tracking**) and multiple devices (**cross-device tracking**) in order to sell ads to firms who wish to show advertising to those users. There are other threats as well, such as **device fingerprinting**, in which the unique features of a user's computer or smartphone can be used to identify the device and the user and be correlated with tracking data for future use. Device fingerprinting, which does not require cookies to uniquely identify users and track them across the Web, is becoming increasingly popular.

Third-party cookies that communicate with external servers to report online activities are the foundation of online surveillance and tracking. Privacy is further threatened by IP trackers that log IP addresses, which, when combined with other information, are able to identify users as they browse the Internet. Effective technological solutions to prevent tracking must prevent the operation of third-party cookies and hide the identity (IP address) of users.

Table 8.9 lists some common tools for reducing or eliminating online tracking and other online and mobile privacy threats.

cross-site tracking uses various types of cookies to track users across the Web

cross-device tracking uses cellphone login and other user-supplied data, combined with cross-site tracking data, to develop a comprehensive picture of user behavior across all devices

device fingerprinting collects unique information from a user's browser or smartphone that can be combined with other data files to identify specific devices and users

TABLE 8.9 TECHNOLOGICAL PROTECTIONS FOR ONLINE PRIVACY

TECHNOLOGY	PRODUCTS	PROTECTION
Apple Intelligent Tracking Prevention (ITP)	Apple Safari web browser	Monitors and disables cross-site tracking cookies and blocks trackers' ability to identify users by IP address
Google Privacy Sandbox	FLEDGE API; Topics API	Tools now being tested by Google to replace cookie-based, targeted advertising in the Google Chrome web browser
Apple App Tracking Transparency (ATT)	Apple iOS	Requires any app that wants to track user activity and share it with other apps or websites to ask user for permission
Differential privacy software	Apple	Reduces the ability to merge different files and de-anonymize consumer data
Privacy default browsers	Epic, Brave, DuckDuckGo	Eliminates tracking cookies and prevents IP tracking
Message encryption	Signal, Gdata Secure Chat, Telegram, Ceerus	Apps that encrypt text and other data that is transferred using smartphones
Spyware blockers	Bitdefender, Avast One, Spybot	Detects and removes spyware, adware, keyloggers, and other malware
Ad blockers	Most browsers; add-on programs: Adblock Plus	Prevents calls to ad servers; restricts downloading of images at user request
Secure e-mail	Hushmail, ProtonMail	E-mail and document encryption
Anonymous remailers	W3 Anonymous Remailer	Enhanced privacy protection for e-mail
Anonymous surfing	Most browsers (i.e., Chrome Incognito; Safari Private Browsing), Tor Browser	Enhanced privacy protection for web browsing
Cookie blockers and managers	Most browsers	Blocks third-party cookies
Public key encryption	Symantec Encryption Desktop	Program that encrypts your mail and documents

Intelligent Tracking Prevention (ITP)
Apple tool that monitors tracking cookies and eliminates those not desired by the user

As previously discussed in Chapter 6, in response to consumer complaints about cross-site tracking, Apple developed **Intelligent Tracking Prevention (ITP)** for its Safari browser. Safari already blocked third-party cookies by default, but ITP extended that functionality by ensuring that first-party cookies would generally be available for only a 24-hour window after a user visited a site. Thereafter, the cookie could not be used for most forms of tracking, and the cookie was deleted entirely if the user did not visit the site again within 30 days. In 2020, Apple started blocking all cookies in Safari that enable cross-site tracking, and since then, Apple has continued to release updated versions that

further limit the ability of advertisers to track users. Google has been slow to follow suit, but finally announced in 2020 that it would begin the process of phasing out third-party tracking with its Google Chrome browser. However, it has postponed the actual phase-out several times and now states that it will not begin until the second half of 2024. In the meantime, Google is testing various "Privacy Sandbox" replacements for such tracking. For more information on this effort, refer to the Chapter 6 *Insight on Society* case, *Going from Third to First*. Apple has also taken steps to make cross-device tracking more transparent to consumers via its App Tracking Transparency (ATT) initiative.

In 2018, Apple began to implement **differential privacy software**, which inhibits the ability of advertisers to merge anonymized consumer data files with other tracking files in order to precisely identify consumers despite efforts to anonymize consumers' data (Agostini and Li, 2022). Privacy-preserving machine learning (PPML) is another technique that is currently the focus of research and development (Apple, Inc., 2022: Microsoft, 2021).

differential privacy software
inhibits the ability of advertisers to merge anonymized consumer data files with other tracking files

Privacy default browsers such as Epic, Brave, and DuckDuckGo, are another effective tool to reduce or eliminate tracking. These browsers identify tracking cookies as they are loaded onto browsers and eliminate them from the browser. They typically also have built-in VPN (virtual private network) software that prevents websites from identifying a device's IP address. These features operate in the background, without user intervention or requests for the user to approve, thus eliminating third-party cookies at the outset of a browsing session. In these browsers, privacy is the default option.

privacy default browsers
identify tracking cookies as they are loaded onto browsers and eliminate them from the browser

Encryption is also potentially an important technology for preserving the privacy of messages and documents. Apple has implemented encryption of its devices and iMessage text messaging, and there are many popular apps to encrypt communications among digital devices. Private browsing is another privacy tool available in most browsers that disables browsing history and cookies. This tool can be useful for protecting a consumer's computer in a shared environment where several users have access to the same computer. Some technologies address the security aspects of privacy, especially the threat of man-in-the-middle attacks. Specialized browsers like Epic encrypt users' browsing and other data entirely, even at the server level. A very common security protocol is HTTPS, which encrypts the messages between a computer and the computer server and verifies that users are communicating with an authentic website and not an imposter site.

Property Rights in Personal Data

One possible solution to online privacy issues is to recognize a property right in personal data, thus enabling individuals to own, control, and receive fair compensation for the use of information about themselves The idea of individuals claiming ownership of their personal data, depositing it into a trusted data store, and then selling that information to third parties is not new, but with the development of supportive digital technologies, today it can be considered a technically feasible approach to some contemporary privacy issues such as control over personal information and transparency (Laudon, 1996; Ritter and Mayer, 2018; Elvy, 2017). A variety of firms, such as Digi.me, Meeco.me, and CitizenMe, have sprung up to enable users to reclaim control over their personal information and monetize their information by selling it to third-party firms (Kent, 2022; Lund and Tranberg, 2021).

For instance, Digi.me has developed an app that allows users to aggregate all their personal information from any source and store it on a cloud storage service like Dropbox or iCloud. From there, users control what information they will share and can choose a variety of tools to analyze their data. CitizenMe has created a platform that allows users to sell access to their data as part of aggregated and anonymized user data. Meeco.me has developed a blockchain approach to personal data that allows individuals to see precisely what information about themselves is being shared online and with whom, to control the information they want to share, and then to seek compensation from third-party users.

LIMITATIONS ON THE RIGHT TO PRIVACY: LAW ENFORCEMENT AND SURVEILLANCE

We've emphasized that privacy in the public sector, or the freedom from government restrictions and searches, is very different from privacy in the private, consumer market sector. But increasingly these different realms of personal information are coming together.

Today, the online and mobile behaviors, profiles, and transactions of consumers are routinely available to a wide range of government agencies and law enforcement authorities, contributing to rising fears among online consumers and, in some cases, their withdrawal from the online marketplace. According to surveys by the Pew Research Center, almost 85% of U.S. adults surveyed felt they had little control over the online data collected about them by the government, and two-thirds felt that the potential risks of such data collection outweighed the potential benefits. More than 60% were concerned about how the government uses the data collected (Pew Research Center, 2020a, 2020b). Those concerns have been heightened by revelations over the last decade that federal government agencies routinely gather cellphone call data on U.S. citizens, with scant judicial oversight. These National Security Agency (NSA) programs involved wholesale collection of cellphone metadata, tapping communications lines of various Internet companies, including Google and Yahoo.

The NSA also enlisted the support of the major telecommunications carriers to give it information about Americans' phone calls and e-mails in a program called PRISM. These programs were conceived in the aftermath of the September 11 terrorist attack and were envisaged as necessary to protect the country. The programs were authorized by a law known as the Patriot Act and were supervised by the U.S. Foreign Intelligence Surveillance Act Court (FISA Court, or FISC) pursuant to the Foreign Intelligence Surveillance Act (FISA). Although the PRISM program was authorized by law, when its existence was revealed, the program alarmed many average citizens, who had previously believed that if they did nothing wrong, surely the government would not be collecting information about them. The revelations also heightened public awareness and criticism of firms like Google, Meta, and others that were engaging in extensive tracking and consumer surveillance (Pew Research Center, 2018). Google, Meta, Microsoft, and other tech companies have since tried to resist or prevent warrantless government access to their users' data.

Striking a balance between security and liberty is at the center of the privacy debate. Although the Internet used to be thought of as impossible for governments to control or monitor, nothing could actually be further from the truth. Law enforcement authorities

have long claimed the right under numerous statutes to monitor any form of electronic communication pursuant to a court order and a judicial review and based on the reasonable belief that a crime is being committed. This includes the surveillance of consumers engaged in e-commerce. A variety of laws, including the Communications Assistance for Law Enforcement Act (CALEA), the Patriot Act, the Cyber Security Enhancement Act, the Homeland Security Act, and the Freedom Act, all enable law enforcement agencies to monitor Internet users without their knowledge and, under certain circumstances, to do so without judicial oversight when life is purportedly at stake.

Taking matters into its own hands, Apple engineered the iPhone with the ability to encrypt e-mails, photos, and contacts stored on the phone using a strong end-to-end encryption algorithm (E2EE) designed to prevent third parties from reading the messages while in transit. Apple also encrypts data stored on the physical iPhone device. The device data can be decrypted only by using a passcode that only the user possesses, and Apple does not retain the key to the code. As a result, Apple has said that it cannot comply with court orders to turn over user data. However, the FBI has been able to crack iPhone device encryption without Apple's support and has said that it would be helping local law enforcement agencies decrypt smartphone and other devices that use encryption.

Law enforcement's ability to obtain data from mobile phones without a warrant has been the subject of a number of court cases. The U.S. Supreme Court has ruled that police need a warrant prior to searching a person's cellphone for information (*Riley v. California*, 2014). The Court noted that cellphones hold extensive detailed personal information, retain information for many years, and store many different types of information. Much of a person's intimate and personal life can be stored on cellphones, or on cloud servers, making cellphones the modern equivalent of personal papers, which are protected under the Constitution's Fourth Amendment. In a subsequent landmark decision, the Court ruled that the government needs to obtain a warrant based on probable cause in order to obtain and use mobile phone location histories held by cellphone companies and, potentially, all firms that collect this data. The Court concluded that cellphones have become so powerful, ubiquitous, and necessary to daily life that they can provide nearly perfect surveillance of users, like the data provided by an ankle monitor. The Court ruled that unlimited law enforcement access to this information is a violation of the Fourth Amendment, which prohibits unreasonable searches (*Carpenter v. United States*, 2018).

However, although the Supreme Court has ruled that the government needs a warrant to obtain cellphone and mobile location data, such restrictions do not apply to the government's ability to purchase such data from data brokers (refer to the *Insight on Technology* case, *Apps that Track: A Double-Edged Sword*). Government agencies are among the largest users of private-sector commercial data brokers, such as Acxiom, Experian, and TransUnion Corporation, that collect a vast amount of information about consumers from various offline and online public sources, such as public records and the telephone directory, and from non-public sources, such as "credit header" information from credit bureaus (which typically contains name, aliases, birth date, social security number, current and prior addresses, and phone numbers). Acxiom has one of the largest private personal databases in the world, with thousands of data attributes on 2.5 billion people in more than 30 countries (Acxiom, 2022). Information collected ranges

from identifying information (e.g., name and phone number) to much more extensive data (e.g., driving records, criminal and civil court records, property records, and licensing records). This information can be linked to the online behavior information that is collected from other commercial sources to compile an extensive profile of an individual's online and offline behavior. The growing link between private- and public-sector personal information, creating a dossier society, had been predicted even before the Internet was developed (Laudon, 1986). Now a growing reality, some critics and authors have forecast the end of privacy in the twentieth-century sense and the dawning of a new, twenty-first-century era in which people are subjected to the pervasive monitoring of their behavior and must take action to protect their privacy more vigorously using available tools.

8.3 INTELLECTUAL PROPERTY RIGHTS

> **Congress shall have the power to "promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."**
>
> —Article I, Section 8, Constitution of the United States, 1788.

Next to privacy, the most controversial ethical, social, and political issue related to e-commerce is the fate of intellectual property rights. Intellectual property refers to products of the human mind. As a general rule, in the United States, the creator of intellectual property owns that property. For instance, if you personally create a website, it belongs entirely to you, and you have exclusive rights to use this "property" in any lawful way you see fit. But the Internet potentially changes things. When intellectual works become digital, it becomes difficult to control access to and use, distribution, and copying of those works. These are precisely the areas that intellectual property law seeks to control.

Digital media differ from books, periodicals, and other media in terms of ease of replication, transmission, and alteration; difficulty in classifying a software work as a program, book, or even music; compactness—making theft easy; and difficulty in establishing uniqueness. Before widespread use of the Internet, copies of software, books, magazine articles, or films had to be stored on physical media, such as paper, computer disks, or videotape, creating hurdles to distribution and raising the costs of illegal copies.

However, the Internet technically permits millions of people to make perfect digital copies of various works—from music to plays, poems, and journal articles—and then to distribute those copies nearly cost-free to hundreds of millions of online users. The proliferation of innovation has occurred so rapidly that few entrepreneurs have stopped to consider who owns the patent on a business technique or method that they are using on their site. In the past, the spirit of the Web was so free-wheeling that many entrepreneurs ignored trademark law and instead registered domain names that could easily be confused with another company's registered trademarks. In short, the Internet has demonstrated the potential to disrupt the traditional conceptions and implementations of intellectual property law that were developed over the last two centuries.

The major ethical issue related to e-commerce and intellectual property concerns how we (both as individuals and as business professionals) should treat property that belongs to others. From a social point of view, the main questions are: Is there continued value in protecting intellectual property in the Internet age? In what ways is society better off, or worse off, for having the concept of property apply to intangible ideas, including music, books, and movies? Should society make certain technology illegal or restrict the use of the Internet just because it has an adverse impact on some intellectual property owners? From a political perspective, we need to ask how the Internet and e-commerce can be regulated or governed to protect the institution of intellectual property while also encouraging the growth of e-commerce and the Internet.

TYPES OF INTELLECTUAL PROPERTY PROTECTION

There are four main types of intellectual property protection: copyright, patent, trademark law, and trade secrets law, each of which we will discuss in further depth in the next few sections. In the United States, the development of intellectual property law begins with the U.S. Constitution, which mandated that Congress devise a system of laws to promote "the progress of science and the useful arts."

The goal of intellectual property law is to balance two competing interests: the public and the private. The public interest is served by the creation and distribution of inventions, works of art, music, literature, and other forms of intellectual expression. The private interest is served by rewarding people for creating these works. The challenge in intellectual property ethics and law is to ensure that creators of intellectual property can receive the benefits of their inventions and works while also making it possible for their works and designs to be disseminated and used by the largest-possible audience (with the exception of trade secret law, in which the object is not to share or distribute works for the common good). Protections from rampant theft of intellectual property inevitably lead to restrictions on distribution, which then restricts payments to creators for the use of their works—which in itself can slow down the distribution process. Without these protections, however, and without the benefits that flow to creators of intellectual property, the pace of innovation could decline.

Maintaining this balance of interests is always challenged by the invention of new technologies. In general, the information technologies of the last century—from radio and television to CD-ROMs, DVDs, and the Internet—have at first tended to weaken the protections afforded by intellectual property law. For instance, in the early years of e-commerce, up to 2005, the balance swung more toward Internet distributors and their claims to be free from restrictions on intellectual property particularly music. Owners of intellectual property have often, but not always, been successful in pressuring Congress and the courts to strengthen the intellectual property laws to compensate for any technological threat and even to extend protection for longer periods of time and to entirely new areas of expression. However, ever since the development of the iTunes store, smartphones, and tablets (in the years after 2005), the balance has swung back toward content owners, largely because Internet distributors depend on high-quality content to attract audiences but also partly due to the effectiveness of lawsuits in raising the costs to Internet firms that fail to protect intellectual property.

COPYRIGHT

copyright law protects original forms of expression, such as writings, art, drawings, photographs, music, motion pictures, performances, and computer programs, from being copied by others for a period of time

In the United States, **copyright law** protects original forms of expression, such as writings (books, periodicals, lecture notes), art, drawings, photographs, music, motion pictures, performances, and computer programs, from being copied by others for a period of time. Copyright does not protect ideas—just their expression in a tangible medium such as digital storage, paper, or handwritten notes. As a general rule, copyright protection lasts for the life of the author, plus an additional 70 years after the author's death. For corporate-owned works, copyright protection generally lasts for 95 years after initial creation.

In the mid-1960s, the Copyright Office began registering software programs, and in 1980, Congress passed the Computer Software Copyright Act, which provides protection for source and object code and for copies of the original software sold in commerce and sets forth the rights of the purchaser to use the software, while the creator retains legal title. For instance, the HTML code for a web page—even though easily available to every browser—cannot be lawfully copied and used for a commercial purpose, say, to create a new website that looks identical.

Copyright protection protects against copying of entire software programs or their parts. Damages and relief are readily obtained for infringement. The drawback to copyright protection is that the underlying ideas behind a work are not protected, only the expression of those ideas in the work. So, for example, a competitor can view the source code on a website to see how various effects were created and then reuse those techniques to create a different website without infringing the copyright on the original website.

Fair Use Doctrine

doctrine of fair use under certain circumstances, permits use of copyrighted material without permission

Copyrights, like all rights, are not absolute. There are situations in which strict copyright observance could be harmful to society, potentially inhibiting other rights such as the right to freedom of expression and thought. As a result, the doctrine of fair use has been created. The **doctrine of fair use** permits teachers, writers, and others to use copyrighted materials without permission under certain circumstances. **Table 8.10** describes the five factors that courts consider when assessing what constitutes fair use.

The fair use doctrine draws upon the First Amendment's protection of freedom of expression, both verbal and written. Journalists, writers, and academics must be able to refer to, and cite from, copyrighted works in order to criticize, or even just discuss those works.

What constitutes copyright infringement versus fair use in the online environment has been at issue in a number of cases and remains unsettled. In general, some courts have accepted the argument that a third party such as Google, which caches material such as thumbnail images or websites on a server and then displays it in response to a search request, is not guilty of copyright infringement (*Field v. Google, Inc.*, 2006; *Perfect 10, Inc. v. Amazon.com, Inc. et al.*, 2007). However, this analysis, known as the "server rule," has been rejected by other courts. For instance, federal district court rulings in New York have ruled that embedding social media photos and videos in third-party websites could potentially give rise to copyright infringement (Gizzo, 2021; Linn, 2020).

In what's known as the "dancing baby case," a mother uploaded a 30-second video to YouTube of her baby dancing to a song by Prince called "Let's Go Crazy." Universal Music

TABLE 8.10 FAIR USE CONSIDERATIONS TO COPYRIGHT PROTECTIONS

FAIR USE FACTOR	INTERPRETATION
Character of use	Nonprofit or educational use versus for-profit use.
Nature of the work	Creative works such as plays or novels receive greater protection than factual accounts (e.g., newspaper accounts).
Amount of work used	A stanza from a poem or a single page from a book, but not the entire poem or an entire book chapter, would be allowed.
Market effect of use	Will the use harm the marketability of the original product? Has it already harmed the product in the marketplace?
Context of use	A last-minute, unplanned use in a classroom versus a planned infringement.

Group, the owner of the copyright to the song, objected and issued a takedown notice under the Digital Millennium Copyright Act (discussed in the next section) to YouTube. The mother sued, claiming that Universal had failed to consider whether use of the song in the video was fair use before issuing the takedown notice. In *Lenz v. Universal Music Corp.* (2015), a federal court agreed that a copyright owner must consider fair use before issuing a takedown notice. In 2017, the Supreme Court declined to review the case, leaving the ruling in force (Hurley, 2017).

Fair use was also at issue in a lawsuit filed by the Authors Guild and five major publishing companies against Google. In 2004, Google announced its Library Project. As part of the project, Google aimed to scan all the books in several university and public libraries and then make snippets and parts of the books available online, without, however, asking for permission from the publishers or paying royalties. Google said it would never show a full page, just relevant portions of a page in response to searches. In 2005, the Authors Guild and the large book publishers filed a lawsuit seeking to prevent Google from implementing the Library Project.

Google argued that the Library Project constituted fair use of publishers' copyrighted works because it published only snippets. Moreover, Google claimed that it was simply helping libraries do what they are intended to do, namely, lend books. Library lending is considered a fair use following an agreement in the late 1930s with publishers, and such lending was codified into the Copyright Act of 1976. Google claimed that helping libraries make books more available to the public was in the broader public interest and extended the existing rights of libraries to encourage book availability.

After many years of litigation, a federal court finally ruled in favor of Google, stating that Google's scanning and making snippets of text available to the public was "fair use" under U.S. copyright law. The judge believed the project had a broad public purpose of making it easier for students, researchers, teachers, and the general public to find books, while also preserving consideration for author and publisher rights. The Google project was "transformative" in the court's view, giving books a new character and purpose, making it easier to discover old books, and leading to increased sales. The Supreme Court affirmed the ruling in 2016, and the matter is now settled from a legal perspective (Liptak and Alter, 2016). However, in the meantime, the project itself stalled, and efforts

to scan libraries' so-called orphan books (books for which the copyright holder could not be identified) have also ended.

Fair use issues with respect to digital libraries also came to the forefront in a recent lawsuit involving the Internet Archive. The Internet Archive maintains a virtual library that has digitized versions of more than 1.3 million books, many of which are still under copyright. Prior to the Covid-19 pandemic, the Internet Archive loaned out only one digital copy of each book at a time, a practice known as controlled digital lending (CDL). Although many in the publishing industry believe that CDL still constitutes copyright infringement (libraries typically purchase a license from publishers in order to be able to distribute e-books, whereas the Internet Archive does not purchase a license), the publishers did not challenge the practice. However, in March 2020, the Archive, citing the pandemic, eased its lending restrictions to allow multiple digital copies of a book to be lent out at the same time. In June 2020, four major publishers sued the Archive; in response, the Archive claimed that its actions were protected by fair use. As of August 2022, the case, which highlights the continuing tensions over copyright issues in the Internet age, is proceeding through the court system and has yet to be resolved (Davis, 2022; Romano, 2020; Albanese, 2020).

Finally, the practice of web scraping also raises copyright and fair use issues. Web scraping involves using an application to extract data from a website. A recent federal court case, *hiQ Labs Inc. v. LinkedIn Corp.* (2022), ruled that hiQ's scraping of publicly accessible data from LinkedIn profiles was not a crime under the Computer Fraud and Abuse Act (see Chapter 5). However, the court noted that copyright infringement remains a valid claim when a scraper is taking and repurposing copyrighted information. For instance, in a previous case, *Associated Press v. Meltwater U.S. Holdings, Inc.* (2013), a federal district court in New York ruled that scraping copyrighted news articles and repurposing them in a subscription newsletter did not constitute fair use and was instead copyright infringement.

The Digital Millennium Copyright Act

Digital Millennium Copyright Act (DMCA)
the first major effort to adjust U.S. copyright laws to the Internet age

The **Digital Millennium Copyright Act (DMCA)** was the first major effort to adjust the copyright laws of the United States to the Internet age, and to this day, it remains the primary statute that defines the relationships among copyright owners, Internet service providers (ISPs) (which in this context also include website publishers as well as firms that provide Internet service), and end users of copyrighted material. The law implements two international treaties of the World Intellectual Property Organization (WIPO), a worldwide body formed by the major nations in North America and Europe as well as by Japan. This is one case in which law preceded or at least was contemporaneous with digital technology. **Table 8.11** summarizes the major provisions of the DMCA.

There are a number of different actors and conflicting interests involved in the process of delivering content on the Internet. Obviously, copyright owners do not want their work copied and distributed without their consent (and probably compensation), and they do not want their digital rights management software programs broken, compromised, or made ineffectual. ISPs want the freedom to use content within the provisions of "fair use" and do not want to be held liable for content that users may post to their websites. ISPs argue that they are similar to telephone transmission lines, merely

TABLE 8.11 THE DIGITAL MILLENNIUM COPYRIGHT ACT

SECTION	IMPORTANCE
Title I, WIPO Copyright and Performances and Phonograms Treaties Implementation	Makes it illegal to circumvent technological measures to protect works for either access or copying or to circumvent any electronic rights management information.
Title II, Online Copyright Infringement Liability Limitation	Limits liability of ISPs and search engines for copyright infringement if they comply with safe harbors. Requires ISPs to "take down" sites they host if the sites are infringing copyrights and requires search engines to block access to infringing sites if they receive proper notice of infringement from the copyright owner.
Title III, Computer Maintenance Competition Assurance	Permits users to make a copy of a computer program for maintenance or repair of the computer.
Title IV, Miscellaneous Provisions	Requires the Copyright Office to report to Congress on the use of copyright materials for distance education; allows libraries to make digital copies of works for internal use only; extends musical copyrights to include "webcasting."

SOURCE: Based on data from United States Copyright Office, 1998.

providing a method of communication, and that they should not be required to monitor their users' activities to see whether they are posting copyrighted material. Such surveillance, ISPs and civil libertarians argue, would constitute a restriction on freedom of expression. In addition, the economics of the Internet could be compromised if ISPs were unnecessarily restricted and had to pay the costs of vetting all content posted by users. The business model of many online firms depends on creating large audiences, and the more content that can be displayed, the larger the audience, and the more ads can be sold. ISPs also generate revenue from selling bandwidth, so the greater the bandwidth required to support large audiences, the better it is for ISPs. Restricting content is thus bad for business. Finally, consumers of Internet content want as much content as possible, at the lowest cost possible, or even free. The more content for users to consume, the more they benefit. The DMCA tries to balance these different interests.

Title I of the DMCA implements the WIPO Copyright Treaty of 1996, which makes it illegal to make, distribute, or use devices that circumvent technology-based protections of copyrighted materials and attaches stiff fines and prison sentences for violations. This makes it illegal, for instance, to break the security software typically found on DVDs, Amazon's Kindle books, and similar devices. There are a number of exceptions to the strong prohibitions against defeating a copyright protection scheme, however, including exceptions for libraries to examine works for adoption, for reverse engineering to achieve interoperability with other software, for encryption research, and for privacy protection purposes.

Title II of the DMCA creates two safe harbors for ISPs. The first safe harbor (the Online Copyright Infringement Liability Limitation Act) provides that ISPs will not be held liable for infringing material that users post to blogs, web pages, or forums as

long as the ISP did not have knowledge that the content was infringing, did not receive any financial benefit attributable to the infringing activity (assuming ISPs can control this activity), and acts expeditiously to remove infringing content when notified by a notice of infringement. This means that users of, say, YouTube can post material that infringes a copyright and that YouTube cannot be held liable (safe harbor) as long as it does not know the material is infringing and as long as it demonstrates that it has in place procedures to take down infringing content as soon as it becomes aware of the matter or receives a proper notice from the copyright owner. Such a notice is called a takedown notice, a claim by the copyright owner that the ISP is hosting infringing content. Copyright owners can also subpoena the personal identities of any infringers using an ISP.

The second safe harbor relates to links to infringing material: ISPs will not be held liable for referring or linking users to a site that contains infringing material or infringing activity. So, for example, a search engine that directs users to a website that contains pirated songs or movies cannot be held liable. This safe harbor is applicable as long as ISPs did not have knowledge that they were linking users to sites containing infringing content, did not receive any financial benefit attributable to the infringing activity (assuming they can control this activity), and acts expeditiously to remove or disable any such link after receiving a proper notice from the copyright owner.

There are a number of administrative requirements for ISPs to be protected by the safe harbor provisions. ISPs must designate an agent to receive takedown notices; adopt and publish a copyright infringement policy (this can be part of a terms of use policy); and comply with takedown notices by removing the content and/or links to the content. The penalties for willfully violating the DMCA include restitution to the injured parties of any losses due to infringement. Criminal remedies may include fines up to $500,000 or five years of imprisonment for a first offense and up to $1 million in fines and 10 years in prison for repeat offenders. These are serious penalties, but they have rarely been imposed.

The DMCA relieves ISPs of any liability for posting or linking to copyrighted material if they can meet the safe harbors' conditions. This means that users of YouTube can post what they want and that YouTube will not be held liable for infringing content even if the content violates YouTube's terms of use policy, which states that users shall not post infringing content. However, the DMCA does require YouTube to remove content or links that are infringing as soon as it receives a valid takedown notice. With respect to receiving financial benefits, ISPs may indeed receive financial benefits from posting infringing content if they can show that they can't control the behavior of their users or that there is no way of knowing prior to the posting that the material is infringing.

ISPs and individuals who post content are also protected from frivolous takedown notices. For instance, the ruling in the *Lenz* "dancing baby" case previously discussed put copyright owners on notice that they need to be careful when issuing takedown notices if use of the copyrighted material might constitute fair use and that the DMCA does not supersede the doctrine of fair use.

Safe harbor provisions of the DMCA were also at the heart of a $1 billion lawsuit brought by Viacom against Google and YouTube for willful copyright infringement. Viacom alleged that YouTube and Google engaged in massive copyright infringement

by deliberately and knowingly building up a library of infringing works to draw traffic to YouTube and enhance YouTube's commercial value. Entire episodes of Viacom TV shows were being posted on YouTube without Viacom's permission. In response, Google and YouTube claimed that they are protected by the DMCA's safe harbor provisions and that it was impossible to know whether a video was infringing or not. However, in response to the lawsuit, Google developed a filtering system (Content ID) aimed at addressing the problem. Many years after the billion-dollar suit was filed and after multiple courtroom appearances, Google and Viacom settled out of court. Google's ability to take down copyrighted material using Content ID had become very effective, and Google agreed to license hundreds of Viacom shows. Both parties recognized in a joint statement that they could achieve their objectives by collaborating rather than by continuing the lawsuit. More recently, YouTube has implemented another program, Copyright Match, that uses matching technology similar to Content ID's to notify creators when their videos have been stolen and posted by another party on YouTube (Liao, 2018).

The DMCA continues to be a source of litigation. In *BMG Rights Management LLC v. Cox Communications, Inc.* (2018), a federal judge let stand a $25 million jury award against Cox Cable in favor of BMG, a rights management firm, for willful contributory infringement. BMG argued that Cox, an ISP, was allowing subscribers to use BitTorrent to upload copyrighted songs to various websites without an effective policy for preventing this activity and was failing to remove repeat offenders from its service. Cox argued that it was just a pipeline to the Internet and could not be held liable for what its users posted or what software they used. The court left the jury award against Cox in place, but it refused to shut Cox down, as BMG had requested, noting that although there is a public benefit to reducing copyright infringement, because Cox provides access to the Internet and enables freedom of speech, these interests trumped BMG's interest in copyright protection. However, the judge also ordered Cox to pay an additional $8 million in legal fees to BMG on the grounds that Cox had willfully violated the DMCA. On appeal, the 5th Circuit Federal Court of Appeal affirmed that Cox was not entitled to a DMCA safe harbor but sent the case back to be re-tried because of other errors by the district court judge. In August 2018, BMG reported that it had settled the case for a substantial payment by Cox (Farrell, 2018; Mullin, 2017; Gardner, 2016).

In 2020, the Copyright Office released a report based on a multi-year study of the DMCA, most particularly its notice and takedown and safe harbor provisions. The report concluded that although the DMCA does not need wholesale changes, it found that the safe harbor provisions were no longer successfully balancing the needs of online service providers and copyright holders, especially in light of the tremendous changes in the online environment over the previous 20 years (United States Copyright Office, 2020). Copyright owners from the film and music industries have been lobbying Congress for changes in the DMCA that would require websites and ISPs to take more effective actions to remove infringing content, and in 2022, a new bill, named the SMART Copyright Act, was introduced into the Senate. Rather than relying on technology companies to develop and implement their own technical measures to police online infringement, the Act would put the Library of Congress in charge of designating such measures, which Internet companies would then be required to implement. Not surprisingly, technology companies are not in favor of the bill (McSherry, 2022).

Copyright Protection in the European Union

The European Union takes a far more proactive view of copyright protection on the Internet, as it has done with privacy with the GDPR. In the past, the European Union had adopted legislation very similar to the DMCA in the United States in which the burden of protecting copyright fell to the content creators and publishers. This situation has dramatically changed.

In 2019, the EU's Directive on Copyright in the Digital Single Market became effective. Countries that are part of the European Union had two years to pass legislation to implement the Directive. However, as of 2022, it has been fully implemented by only four EU member states (including Germany and the Netherlands) and partially implemented by only four others (including France and Denmark), and the European Commission has begun infringement proceedings against those EU member states that have not yet implemented the Directive (European Commission, 2021). The Directive is intended to force firms like Google and Meta to pay creators and publishers of content such as music, news, and art, which Internet firms now often use without fair compensation to the creators. The legislation also reflects European objections to the dominance of U.S. Internet firms like Google and Meta and, like the GDPR, is part of a longer-term EU strategy called Single Digital Market, which aims to integrate digital policies involving privacy and intellectual property across the entire European Union rather than have each country make its own policy in these areas (Vincent, 2020; European Commission, 2015, 2019; European Parliament, 2018; Brown, 2018; Michaels, 2018).

PATENTS

> **"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title."**
>
> —Section 101, U.S. Patent Act

patent
grants the owner an exclusive monopoly on the ideas behind an invention a certain period of time, typically 20 years

A **patent** grants the owner an exclusive monopoly on the ideas behind an invention for a certain period of time, typically 20 years. The intent behind patent law was to ensure that inventors of new machines, devices, or industrial methods would receive the full financial and other rewards of their labor and still make widespread use of the invention possible by providing detailed diagrams for those wishing to use the idea under license from the patent's owner. Patents are obtained from the United States Patent and Trademark Office (USPTO). Obtaining a patent is much more difficult and time consuming than obtaining copyright protection (which is automatic with the creation of the work). Patents must be formally applied for, and the granting of a patent is determined by Patent Office examiners, who follow a set of rigorous rules. Ultimately, federal courts decide when patents are valid and when infringement occurs.

Patents are very different from copyrights because patents protect the ideas themselves and not merely the expression of those ideas. There are four types of inventions for which patents are granted under patent law: machines, man-made products, compositions of matter, and processing methods. The Supreme Court has determined that patents extend to "anything under the sun that is made by man" (*Diamond v. Chakrabarty*, 1980),

as long as the other requirements of the Patent Act are met. There are three things that cannot be patented: laws of nature, natural phenomena, and abstract ideas. For instance, a mathematical algorithm cannot be patented unless it is realized in a tangible machine or process that has a "useful" result (the mathematical algorithm exception).

In order to be granted a patent, the applicant must show that the invention is new, original, novel, nonobvious, and not evident in prior arts and practices. As with copyrights, the granting of patents has moved far beyond the original intent of Congress's first patent statute, which sought to protect industrial designs and machines. For instance, patent protection has been extended to articles of manufacture (1842), plants (1930), surgical and medical procedures (1950), and software (1981). The Patent Office did not accept applications for software patents until a 1981 Supreme Court decision that held that computer programs could be part of a patentable process. Since that time, thousands of software patents have been granted. Virtually any software program can be patented as long as it is novel and not obvious.

Essentially, as technology and industrial arts progress, patents have been extended to both encourage entrepreneurs to invent useful devices and to promote widespread dissemination of the new techniques through licensing and artful imitation of the published patents (the creation of devices that provide the same functionality as the invention but use different methods). Patents encourage inventors to come up with unique ways of achieving the same functionality as existing patents. For instance, Amazon's patent on one-click purchasing caused Barnesandnoble.com to invent a simplified, two-click method of purchasing. The danger of patents is that they stifle competition by raising barriers to entry into an industry. Patents force new entrants to pay licensing fees to incumbents, which thus slows down the development of technical applications of new ideas by creating lengthy licensing applications and delays.

Much of the Internet's infrastructure and software was developed under the auspices of publicly funded scientific and military programs in the United States and Europe. Most of the inventions that make the Internet and e-commerce possible were not patented by their inventors. The early Internet was characterized by a spirit of worldwide community development and a sharing of ideas, without consideration of personal wealth (Winston, 1998). This early Internet spirit changed in the mid-1990s with the commercial development of the Web. However, although companies obtain patents, some critics of Big Tech companies believe that patent infringement has become a business strategy, particularly with respect to patents held by smaller companies. Although in some cases the infringing company must ultimately pay a large settlement to the company that owns the patent, the settlement is seen merely as a cost of doing business. For example, in 2022, a federal jury found that Yahoo had infringed on a patent owned by a small company, Droplets, that covered technology for quickly updating web pages and ordered Yahoo to pay Droplets $15 million. Yahoo is appealing the verdict (Michel, 2022; Atkins, 2022). **Table 8.12** lists a few of the better-known e-commerce patents.

TRADEMARKS

> **A trademark is "any word, name, symbol, or device, or any combination thereof . . . used in commerce . . . to identify and distinguish . . . goods . . . from those manufactured or sold by others and to indicate the source of the goods."**
>
> —The Trademark Act, 1946

TABLE 8.12 SELECTED E-COMMERCE PATENTS

COMPANY	SUBJECT	DESCRIPTION
Amazon	One-click purchasing	Probably one of the most well-known (and contentious) e-commerce patents. Amazon attempted to use the patent to force changes to Barnes & Noble's website, but a federal court overturned a previously issued injunction. Eventually settled out of court. In 2007, a USPTO panel rejected some of the patent because of evidence that another patent predated it. Amazon amended the patent, and the revised version was confirmed in 2010. Patent expired on September 11, 2017.
Priceline	Buyer-driven, "name your price" sales	Originally filed by Walker Digital, an intellectual property laboratory, and then assigned to Priceline. Granted in 1999. Shortly thereafter, Priceline sued Microsoft and Expedia for copying its patented business method.
DoubleClick	Dynamic delivery of online advertising	The patent underlying DoubleClick's business of online banner ad delivery, originally granted in 2000. DoubleClick sued competitors for violating the patent and ultimately reached a settlement with them.
Overture	Pay for performance search	System and method for influencing position on search result list generated by computer search engine, granted in 2001. Competitor FindWhat sued Overture, charging that the patent had been obtained illegally; Overture countered by suing both FindWhat and Google for violating the patent. Google agreed to pay a license fee to Overture in 2004 to settle.
Soverain Software	Purchase technology	The so-called "shopping cart" patent for network-based systems, which involves any transaction over a network involving a seller, buyer, and payment system. In other words, e-commerce! Soverain filed suit against Amazon for patent infringement, which Amazon paid $40 million to settle.
MercExchange (Thomas Woolston)	Auction technology	Patents on person-to-person auctions and database search, originally granted in 1995. eBay was ordered to pay $25 million in 2003 for infringing on patent. In 2007, a motion for permanent patent injunction against eBay was denied. MercExchange and eBay settled the dispute in 2008 on confidential terms.
Google	Search technology	Google PageRank patent filed in 1998 and granted in 2001. Became non-exclusive in 2011 and expired in 2017.
Facebook	Social technology	A 2010 patent on an algorithm for developing personalized stories and newsfeeds on a social network.

trademark
a mark used to identify and distinguish goods and indicate their source

A **trademark** is a mark used to identify and distinguish goods and indicate their source. Trademark law is a form of intellectual property protection that exists at both the federal and the state levels in the United States. The purpose of trademark law is twofold. First, trademark law protects the public in the marketplace by ensuring that the public gets what it pays for and wants to receive. Second, trademark law protects the owner—who has spent time, money, and energy bringing the product to the marketplace—against piracy and misappropriation. Trademarks have been extended from single words to pictures, shapes, packaging, and colors. Some things, such as common words that are descriptive and generic ("clock"), may not be trademarked. Federal trademarks are obtained, first, by use in interstate commerce and, second, by registration with the U.S. Patent and Trademark Office (USPTO). Federal trademarks are granted for a period of 10 years and can be renewed indefinitely.

Disputes over federal trademarks involve establishing infringement. The test for infringement is twofold: market confusion and bad faith. Use of a trademark that creates

confusion with existing trademarks, causes consumers to make market mistakes, or misrepresents the origins of goods is an infringement. In addition, the intentional misuse of words and symbols in the marketplace to extort revenue from legitimate trademark owners ("bad faith") is proscribed.

The Federal Trademark Dilution Act (FTDA) creates a federal cause of action for dilution of famous marks. This legislation dispenses with the test of market confusion (although that is still required to claim infringement) and extends protection to owners of famous trademarks against **dilution**, which is defined as any behavior that would weaken the connection between the trademark and the product. The Trademark Dilution Revision Act (TDRA) allows a trademark owner to file a claim based on a "likelihood of dilution" standard, rather than having to provide evidence of actual dilution. The TDRA also expressly provides that dilution may occur through blurring (weakening the connection between the trademark and the goods) and tarnishment (using the trademark in a way that makes the underlying products appear unsavory or unwholesome).

dilution
any behavior that would weaken the connection between the trademark and the product

Trademarks and the Internet

The Internet and Web have provided opportunities for firms with distinctive and famous trademarks to extend their brands into the online environment. These same developments have provided malicious individuals and firms the opportunity to "squat" on domain names built upon famous marks as well as to attempt to confuse consumers and dilute famous or distinctive marks. The conflict between legitimate trademark owners and malicious firms was allowed to fester and grow because Network Solutions Inc. (NSI), originally the Internet's sole agency for domain name registration for many years, had a policy of "first come, first served." This meant that anyone could register any domain name that had not already been registered, regardless of the trademark status of the domain name. However, NSI was not authorized to decide trademark issues.

In response to a growing number of complaints from owners of famous trademarks who found their trademark names being appropriated by web entrepreneurs, Congress passed the **Anticybersquatting Consumer Protection Act (ACPA)**. The ACPA creates civil liabilities for anyone who attempts in bad faith to profit from an existing famous or distinctive trademark by registering a domain name that is identical or confusingly similar to, or "dilutive" of, that trademark. The Act does not establish criminal sanctions. It proscribes using "bad-faith" domain names to extort money from the owners of the existing trademark (**cybersquatting**) or using the bad-faith domain to divert web traffic to the bad-faith domain that could harm the goodwill represented by the trademark, create market confusion, or tarnish or disparage the mark (**cyberpiracy**). The Act also proscribes the use of a domain name that consists of the name of a living person, or a name confusingly similar to an existing personal name, without that person's consent, if the registrant is registering the name with the intent to profit by selling the domain name to that person. However, the ACPA does not prevent the fair use of trademarks or any use protected by the Constitution's First Amendment, such as so-called "gripe sites."

Anticybersquatting Consumer Protection Act (ACPA)
creates civil liabilities for anyone who attempts in bad faith to profit from an existing famous or distinctive trademark by registering an Internet domain name that is identical or confusingly similar to, or "dilutive" of, that trademark

cybersquatting
involves the registration of an infringing domain name, or other Internet use of an existing trademark, for the purpose of extorting payments from the legitimate owners

cyberpiracy
involves the same behavior as cybersquatting but with the intent of diverting traffic from the legitimate site to an infringing site

In one of the first cases involving the ACPA, E. & J. Gallo Winery, owner of the registered mark "Ernest and Julio Gallo" for alcoholic beverages, sued Spider Webs Ltd. for using the domain name Ernestandjuliogallo.com. Spider Webs Ltd. was a domain name speculator that owned numerous domain names consisting of famous company names. The Ernestandjuliogallo.com website contained information on the risks of alcohol use

and anti-corporate articles about E. & J. Gallo Winery and, in addition, was poorly constructed. The court concluded that Spider Webs Ltd. was in violation of the ACPA, that its actions constituted dilution by blurring because the Ernestandjuliogallo.com domain name appeared on every page printed off the website accessed by that name, and that Spider Webs Ltd. was not free to use this particular mark as a domain name (*E. & J. Gallo Winery v. Spider Webs Ltd.*, 2002). The largest cybersquatting judgment under the ACPA to date has been a $33 million verdict in favor of Verizon against OnlineNIC, an Internet domain registration company that had used more than 660 names that could easily be confused with legitimate Verizon domain names.

Typosquatting is a form of cybersquatting or cyberpiracy in which a domain name contains a common misspelling of another site's name. These domains are sometimes referred to as "doppelganger" domains. Often the user ends up at a site very different from the one they intended to visit. For instance, John Zuccarini is an infamous typosquatter who has been both fined by the FTC as well as jailed for setting up pornographic websites with URLs based on misspellings of popular children's brands, such as Bob the Builder and Teletubbies. Harvard Business School professor Ben Edelman conducted a study that found that there were at least 938,000 domains typosquatting on the top 3,264 ".com" websites and that 57% of these domains included Google pay-per-click ads. Typosquatting is also often used by hackers to create websites that distribute malware, harvest user credentials, or take other malicious action.

In addition to legal action under the ACPA, cybersquatting cases can be handled by WIPO under its Uniform Domain Name Dispute Resolution Policy (UDRP). WIPO considers the UDRP to be a vital enforcement tool and handled more than 55,000 UDRP complaints from 1999 to 2021 (with a record 5,100 complaints filed in 2021). According to WIPO, most domain name disputes are resolved by a transfer of the domain in question to the trademark owner. The increasing number of cybersquatting cases filed with WIPO has resulted from a number of factors, including the proliferation of websites being used for counterfeit sales, phishing, and other forms of online trademark abuse (WIPO, 2022; Isenberg, 2022).

The expansion of generic top-level domains (gTLDs) authorized by ICANN (Internet Corporation for Assigned Names and Numbers) (see Chapter 3) has been another source of concern in terms of trademark protection. Successful applicants become owners of these gTLDs and can create and sell new domains with the gTLD suffix. Many of these new domains may potentially conflict with the established trademarks of others. To deal with these trademark conflicts, ICANN developed a set of procedures to rapidly resolve disputes called the Uniform Rapid Suspension System (URS), a domain name dispute procedure that allows a trademark owner to seek suspension of a domain name in a new gTLD. ICANN also established a Trademark Clearing house as a repository of data on registered, court-validated, or statute-protected trademarks. Trademark owners register their marks for a fee.

Trademark abuse can also involve elements that are not as visible to consumers. For instance, the legal status of using famous or distinctive marks as metatags (which are used to enable search engines to more easily identify relevant aspects of a website) is complex and subtle. The use of trademarks in metatags is permitted if the use does not mislead or confuse consumers. For instance, a car dealer would be permitted to use a famous automobile trademark in its metatags if the dealer sold this brand of

automobiles, but a pornography site could not use the same trademark, nor could a dealer for a rival manufacturer. A Ford dealer would most likely be infringing if it used "Honda" in its metatags but would not be infringing if it used "Ford" in its metatags. (Ford Motor Company would be unlikely to seek an injunction against one of its dealers.)

The permissibility of using trademarks as keywords on search engines is also subtle and depends (1) on the extent to which such use is considered to be a "use in commerce" and causes "initial customer confusion" and (2) on the content of the search results. For instance, Google faced lawsuits alleging that its advertising network illegally exploited others' trademarks. Insurance company GEICO challenged Google's practice of allowing competitors' ads to appear when a searcher typed "Geico" as the search query. A U.S. federal court ruled that this practice did not violate federal trademark laws as long as the word "Geico" was not used in the ads' text. Rosetta Stone, the language-learning software firm, also filed a lawsuit against Google for trademark infringement, alleging that Google's AdWords program allowed other companies to use Rosetta Stone's trademarks for online advertisements without permission. A federal court ruled that Google could potentially be found liable for trademark infringement, pointing to evidence that an internal Google study revealed that even sophisticated users were sometimes unaware that sponsored links were advertisements. In 2012, Rosetta Stone and Google settled, which was seen as a strategic win for Google because it eliminated one of the last major cases challenging the legitimacy of its AdWords program. Currently, Google allows anyone to buy anyone else's trademark as a keyword. Microsoft follows this practice as well with Bing and Yahoo Search. A recent study found that using a competitor's keywords offers better clickthrough rates, particularly for brands interested in attracting consumers who are searching for high-end products (Bhattacharya, 2022).

TRADE SECRETS

Much of the value created by a firm lies not in copyrights, patents, or even trademarks. Instead, there is a kind of intellectual property that involves business procedures, formulas, and methods of manufacture and service delivery and from which the firm derives value and which it does not want to share with others in the form of a patent application or a copyright application. This type of intellectual property is referred to as **trade secrets**. Most famously, the formula for Coca Cola is considered a trade secret, as are the manufacturing techniques for producing General Electric's jet engine turbine blades. Trade secrets differ from other copyright and patent protections because the former may not be unique or novel. Information in a firm can be considered a trade secret if (1) it is a secret (something that others do not know), (2) it has commercial value to its owner, and (3) the owner has taken steps to protect the secret. U.S. corporations are believed to own trillions of dollars' worth of trade secrets.

trade secret
information that is secret, has commercial value, and has been protected by its owner

Until recently, trade secrets were defined and enforced mostly in state laws because historically, businesses were local, as was the theft of business trade secrets. In the digital age, however, when business is national and global, a new level of protection was needed that makes it easier to enforce trade secret laws. In 2016, the Defend Trade Secrets Act (DTSA), which creates a federal private right of action for trade secret protection, was enacted. DTSA is a response to the large-scale theft of trade secrets (also known as economic sabotage) by hackers and foreign nations from U.S. corporate and government information systems (Lee, 2016).

8.4 GOVERNANCE

governance involves social control: Who will control e-commerce? What elements will be controlled? How will the controls be implemented?

Governance involves social control: Who will control the Internet? Who will control the processes, the content, and the activities of e-commerce? What elements will be controlled, and how will the controls be implemented? A natural question arises and needs to be answered: Why do we as a society need to "control" e-commerce? Because e-commerce and the Internet are so closely intertwined (although not identical), controlling e-commerce also involves regulating the Internet.

CAN THE INTERNET BE CONTROLLED?

Early Internet advocates argued that the Internet was different from all previous technologies. They contended that the Internet could not be controlled, given its inherently decentralized design, its ability to cross borders, and its underlying packet-switching technology, which made monitoring and controlling message content impossible. Many still believe this to be true today. The implication is that online content and behavior cannot be "controlled." However, issues such as how to deal with what some believe to be offensive content and potentially harmful behaviors, along with the commercial issue of intellectual property protection, has ushered in the current era of growing governmental regulation of the Internet and e-commerce throughout the world. Currently, we are in a mixed-mode policy environment where self-regulation via a variety of Internet policy and technical bodies co-exists with an increasing amount of government regulation. See Chapter 3 for a review of the different governing bodies involved in overseeing the Internet.

In fact, as you learned in the Chapter 3 *Insight on Society* case, *Government Regulation and Surveillance of the Internet*, the Internet can actually be very easily controlled, monitored, and regulated from central locations (such as network access points, telecommunications firm or agency fiber trunk lines, as well as servers and routers throughout the network). For instance, in China, Saudi Arabia, Iran, North Korea, Thailand, Singapore, and many other countries, online access is controlled from government-owned centralized routers that direct traffic across their borders and within the country (such as China's "Great Firewall of China," which permits the government to block access to certain U.S. or European websites), or via tightly regulated ISPs operating within the countries.

In the United States, as we have seen in our discussion of intellectual property, websites can be put out of business for violating existing laws, and ISPs can be forced to "take down" offending or stolen content. Government security agencies such as the NSA and the FBI can obtain court orders to monitor ISP traffic and engage in widespread monitoring of millions of e-mail messages. Under the Patriot Act, U.S. intelligence authorities are permitted to tap into whatever Internet traffic they believe is relevant to the campaign against terrorism and, in some limited circumstances, to do so without judicial review. Working with the large ISP firms such as AT&T, Verizon, and others, U.S. security agencies have access to nearly all Internet communications throughout the country. And to prevent gambling, shopping, and other activities not related to a business purpose, many U.S. corporations have restrictions on their employees' at-work use of the Web.

In the United States, efforts to control online content have run up against equally powerful social and political values, such as those embodied by the U.S. Constitution's First Amendment, which states that "Congress shall make no law . . . abridging the freedom of speech, or of the press." First Amendment concerns have formed the basis for a number of rulings by the Supreme Court that have struck down laws attempting to limit online content in the United States. Online industry leaders have strongly opposed restrictions on what their users post and the notion that they should exercise editorial control over user content. However, both regulators and online firms are struggling to define the limits of free speech in the wake of the growth of online bullying, phony news sites, and hate groups. The *Insight on Business* case, *Section 230: Should the Law that "Created" Today's Internet Be Repealed or Revised?*, examines this issue further.

TAXATION

Few issues illustrate the complexity of governance and jurisdiction more potently than taxation of e-commerce sales. In the United States, state and local governments rely in part on sales taxes (sometimes also referred to as consumption taxes) based on the type and value of goods sold. In the United States, there are 50 states, 3,000 counties, and 12,000 municipalities, each with unique tax rates and policies. Cheese may be taxable in one state as a "snack food" but not taxable at all in another state (such as Wisconsin), where cheese is considered a basic food. Sales taxes are generally recognized to be regressive because they disproportionately tax poorer people, for whom consumption is a larger part of their total income. Nevertheless, state and local sales taxes are a major source of revenue, especially in states where there are no income taxes.

Sales taxes were first implemented in the United States in the late 1930s as a Depression-era method of raising money for localities. Ostensibly, the money was to be used to build infrastructure such as roads, schools, and utilities to support business development, but over the years the funds have been used for general government purposes of the states and localities. In most states, there is a state-based sales tax and a smaller local sales tax. The total sales tax ranges from zero in some states (North Dakota) to as much as 13% in New York City for the combined state and city sales taxes.

The development of "remote sales" such as mail order/telephone order (MOTO) retail in the United States in the 1970s broke the relationship between physical presence and commerce, complicating the efforts of state and local tax authorities to tax all retail commerce. States sought to force MOTO retailers to collect sales taxes for them based on the address of the recipient, but various Supreme Court decisions established that states had no authority to force MOTO retailers to collect state taxes unless the businesses had a "nexus" of operations (physical presence) in the state.

However, the explosive growth of e-commerce once again raised the issue of how—and if—to tax remote sales. For many years, e-commerce benefited from a tax subsidy of up to 13% for goods shipped to high sales tax areas. Local retail merchants complained bitterly about the e-commerce tax subsidy. E-commerce merchants argued that this form of commerce needed to be nurtured and encouraged and that in any event, the crazy quilt of sales and use tax regimes would be difficult for Internet merchants to administer. Online giants like Amazon argued that they should not have to pay taxes in states where they had no operations because they did not benefit from local school,

INSIGHT ON BUSINESS

SECTION 230: SHOULD THE LAW THAT "CREATED" TODAY'S INTERNET BE REPEALED OR REVISED?

In 1996, the Internet and Web as we know it today did not yet really exist. There was no Facebook, Twitter, Google, YouTube, or Wikipedia. Only about 20 million U.S. adults had access to the Internet, and they spent fewer than 30 minutes a month online. AOL, along with Prodigy and Compuserve, were the world's largest ISPs. But there were a few features that would be recognizable today, including bulletin boards (forums) and blogs (although they were not yet called that). The U.S. Congress at that time was very concerned about online pornography and in that year, passed the Communications Decency Act, a law designed primarily to regulate obscenity and indecency on the Internet. Most of the law was quickly found to be unconstitutional by the Supreme Court, but one provision survived: Section 230. Congress, of course, had no inkling at the time that Section 230 would later come to be viewed as making the Internet of today possible.

Section 230 has two major provisions: Section 230(c)(1) and Section 230(c)(2). Section 230(c)(1) provides that online companies that enable the posting of user content should not be treated as a publisher or speaker of that content and, therefore, should not be held legally responsible (liable) for that content. This section of the law likens such services to the telephone system or bookstores, which are not responsible for unlawful content that they may play a part in distributing. Congress believed that such a provision would give needed support for what was, at the time, a nascent industry. Without this provision, early Internet companies might have had to spend too much time and resources moderating content to avoid being subjected to potential liability.

Section 230(c)(2) provides that online companies shall not be held liable if they choose, in good faith, to remove user content that they deem offensive. This provision resulted from a lawsuit involving user content on a Prodigy bulletin board that a company alleged was defamatory. A New York state court found Prodigy liable because Prodigy exercised editorial control over bulletin board content, at times removing content it believed to be objectionable. The court case presented Internet firms with a difficult choice—either moderate content (but be subject to the risk of potential legal liability) or don't moderate any content (but run the risk of objectionable content that might harm their business interests). Section 230(c)(2) aimed to remove that concern. In the years that followed the passage of Section 230, courts interpreted it as creating broad immunity with respect to any claims based on user content, even if the platform knew the content was unlawful. Doing so enabled business models based on user content, such as social media, to flourish. The law has been widely characterized as laying the foundation for the Internet we know today.

However, Section 230 has become a lightning rod in recent years, particularly in relation to social media platforms, such as Facebook and Twitter, that host a flood of divisive content, including what many believe to be harmful disinformation. Adding fuel to the fire, in October 2021, the *Wall Street Journal* published an exposé based on a trove of documents leaked by Frances Haugen, a former Facebook product manager, revealing that Facebook was aware of the harm the company's platforms can inflict, including on teenagers' mental health.

In the current, heightened political climate, Section 230 has been attacked from both sides. Many Republicans have called for its repeal or reform because they believe that Big Tech companies are biased against conservative viewpoints and that, enabled by Section 230(c)(2), they act to censor certain voices. These critics want to prevent Big Tech platforms from being able to unilaterally decide what content they will remove, label, or restrict. Many Democrats also want reform, but for a different reason. They contend that Section 230(c)(1), by granting Internet platforms legal immunity with respect to user content, reduces these platforms' incentive to proactively remove content that causes social harm, especially when that content can be economically valuable to them. Seemingly no one is happy with Section 230 anymore, except the technology companies it was originally designed to protect. Most of these companies want Section 230 to remain as it has always been, with some companies viewing any kind of reform effort as an existential threat to the Internet.

Some Section 230 critics focus on the amplification caused by algorithms and suggest removing liability protection when social media algorithms promote harmful content. However, it is unclear whether it would be possible to design an algorithm that amplifies only "good" content, nor is it clear how "good" versus "bad" content should be determined. Others have suggested that a platform's safe harbor protections be tied to its use of reasonable content moderation policies, although doing so raises First Amendment issues. Some lawmakers have proposed eliminating Section 230 protections for "market-dominant" Internet platforms or have said that eligibility for Section 230 safe harbors should be based on political neutrality. Still others warn that any Section 230 reform itself may have unintended and harmful side effects, pointing to a previous amendment aimed at fighting online sex trafficking that reportedly actually made prosecuting such crimes more difficult. The Internet Society warns that Section 230 impacts not just platforms such as Facebook and Google but also underlying infrastructure providers, such as cloud providers, that move content and data from one place to another.

Given the polarized views about Section 230 (according to Pew Research, 56% of U.S. adults say that people should not be able to sue social media companies for content that users post on their platforms, while 41% say that people should be able to do so), it's unclear whether enough bipartisan support can be developed to either repeal or amend Section 230 anytime soon.

In the meantime, in October 2022, the Supreme Court announced that it would hear the case of *Gonzalez v. Google*. In that case, relatives of a woman killed in a terrorist attack in Paris, France in 2015, sued Google, claiming that YouTube algorithms promoted radicalizing videos posted by ISIS inciting violence and recruiting potential supporters. This is the first time the Supreme Court will address issues relating to Section 230, specifically whether a platform such as YouTube can still claim immunity when it takes affirmative action via recommendation algorithms to suggest and recommend content to its users. The outcome of the case is likely to have a significant impact on the shape of the Internet of the future.

SOURCES: "A New Supreme Court Case Could Fundamentally Change the Internet," by Ian Millhiser, Vox.com, October 6, 2022; "Can Section 230 Reform Advocates Learn from Past Mistakes," by Julie Pattison-Gordon, Govtech.com, March 15, 2022; "Section 230: How It Shields Facebook and Why Congress Wants Changes," by Marguerite Reardon, Cnet.com, October 6, 2021; "It's Time to Update Section 230," by Michael D. Smith and Marshall Van Alystene, *Harvard Business Review*, August 12, 2021; "56% of Americans Oppose the Right to Sue Social Media Companies for What Users Post," by Colleen McClain, Pewresearch.org, July 1, 2021; Congressional Research Service, "Section 230: An Overview," Crsreports.congress.gov, April 7, 2021; "What Will Changing Section 230 Mean for the Internet," by Adi Robertson, Theverge.com, February 26, 2021; "Twenty-Six Words Created the Internet. What Will It Take to Save It," by Stephen Engleberg, Propublica.com, February 9, 2021; "Jurassic Web," by Farhad Manjoo, Slate.com, February 24, 2009.

police, fire, and other governmental services. State and local governments meanwhile saw billions of tax dollars slipping from their reach. But as Amazon's business model changed, with its building of large distribution centers close to urban areas to enable next-day delivery, so too did its opposition to paying sales taxes. In 2015, the Supreme Court upheld a challenge to a Colorado law that would have required firms to report online sales to Colorado state residents as one step to ensure that the residents paid taxes on such sales in Colorado, which is required by state law. However, in 2018, in the landmark *South Dakota v. Wayfair* case, the Supreme Court reversed its earlier position and ruled that states can levy sales taxes on online sales (*South Dakota v. Wayfair*, 2018).

In 1998, Congress passed the Internet Tax Freedom Act (ITFA), which placed a moratorium on state taxes that discriminate between e-commerce products and services and similar nondigital products and services, as well as on taxes on Internet access, for three years (until 2001), on the grounds that the fledging industry needed to be encouraged. The moratorium was extended several times, and in 2016, Congress made the ban permanent, except with respect to a handful of grandfathered states, which retained the right to continue taxing until July 2020. According to some estimates, the ITFA has resulted in a loss of about $6.5 billion annually in state and local tax revenue, with an additional $1 billion annually added to the total when the remaining states lose their special status. As with online sales taxes, some analysts argue that the growth of e-commerce and Internet industries means that special tax status is no longer needed, whereas Internet providers argue that the legislation ensures that consumers are not charged unnecessary taxes (Bloomberg Law, 2020).

However, the Internet sales tax battle is not totally over: It has just moved to a different venue. In 2021, the state of Maryland enacted a first-of-its-kind digital advertising services tax, which became effective in January 2022. The tax will be imposed on companies with global gross revenues of more than $100 million and will be based on annual gross revenue derived from digital advertising services provided in Maryland. The amount of "Maryland revenue" is to be calculated by dividing the number of devices within Maryland that access such services by the number of worldwide devices and then multiplying the resulting product by global gross revenues. The tax is currently the subject of multiple lawsuits filed by various industry groups in both state and federal courts, alleging a violation of the ITFA as well as the Commerce and Due Process clauses of the U.S. Constitution. Those who support the legislation argue that the digital advertising is not similar to nondigital advertising and therefore does not violate the ITFA. It is likely to be several years before the fate of the legislation is ultimately decided (Grant Thornton, 2022; Democracy Forward, 2021).

NET NEUTRALITY

net neutrality
the concept that ISPs should treat all Internet traffic equally (or "neutrally")

Net neutrality refers to the idea that ISPs, including cable Internet and wireless carriers, should treat all data on the Internet in the same manner and not discriminate or price differentially by content, protocol, platform, hardware, or application. Prior to 2015, ISPs could discriminate against certain users on the basis of protocol or amount of usage. For instance, users of illegal downloading sites that utilize the BitTorrent protocol were blocked or throttled back (i.e., Internet speeds were slowed). Users who watched large numbers of movies on Netflix or other services were occasionally throttled back;

wireless cellphone carriers choked off data speeds for heavy users when the carriers' networks became clogged; and large Internet services like Netflix and YouTube, which together consume a significant percentage of the Internet's bandwidth in the United States, were encouraged to strike deals with ISPs and pay a higher fee than ordinary business or home users pay (Gryta, 2015a).

ISPs had long opposed the idea of net neutrality, claiming that they needed to be able to manage the loads on their networks to ensure stable service without blackouts or slowdowns. Throttling back users that consumed excessive amounts of bandwidth was necessary to manage network load. They also argued that such users should pay more than an average user, who primarily uses the Internet for e-mailing, web surfing, and e-commerce, none of which requires a lot of bandwidth. In addition, the ISPs argued that preventing them from charging more for higher speeds would discourage them from investing in additional infrastructure. More to the point, the ISPs claimed that the Federal Communications Commission (FCC) did not have the authority to regulate ISPs because ISPs were not defined by the FCC as common carriers like traditional telephone companies. ISPs instead were classified in FCC regulations of the 1990s as information services in large part because the Internet, at that time, was considered to be an innovative provider of information that should be nurtured and not interfered with or regulated by the FCC. The Internet then was just not that important to the operation of society.

In 2015, the FCC ruled that ISPs should be viewed as public utilities similar to telephone companies and therefore should be regulated by the FCC in order to ensure fair access to all, deployment of acceptable broadband service levels, and competition among providers. This change reflected the fact that the Internet had evolved by 2015 into one of the primary telecommunications services in the country and the world, and had become necessary to the everyday lives of millions of people, businesses, and governments. The ruling did not provide for regulation of ISP pricing, which remained in the hands of the ISPs (Gryta, 2015b). In 2016, a federal appeals court upheld the FCC view that ISPs were utilities that act as neutral platforms for the transmission of speech. However, in 2017, the Trump administration reversed the FCC's 2015 net neutrality ruling, and in 2018, the FCC returned to the previous regulatory framework, in which ISPs would be regarded as information services and not as regulated utilities subject to FCC regulations. In 2019, a federal appeals court upheld the repeal of the FCC's net neutrality regulations but also ruled that the FCC did not have the power to prohibit states from enacting their own regulations.

In 2020, Mozilla and other parties to the litigation stated that they would not seek Supreme Court review of the decision, on the grounds that the decision allowed a path forward via action at the state level. California and a number of other states had passed their own net neutrality laws but had held them in abeyance pending resolution of the lawsuit. In 2022, a federal court of appeals rejected a challenge to the California law, and the group of industry associations that represents the major Internet providers abandoned their efforts to block its implementation. Since then, 11 additional states have introduced net neutrality legislation, and the Biden administration has encouraged the FCC to reinstate its former net neutrality policy (Shepardson, 2022; NCSL, 2022; Eggerton, 2020).

ANTITRUST, MONOPOLY, AND MARKET COMPETITION IN THE INTERNET ERA

For the first time in the history of the Internet and e-commerce, a broad swath of opinion makers, including economists, politicians, regulators, civic groups, and journalists, are saying that some e-commerce firms have become too powerful and are restricting competition by snuffing out or buying smaller innovative firms and that they are engaging in the restraint of trade. Alphabet (Google), Amazon, and Meta, in particular, are in the crosshairs of critics because they not only dominate their markets but also dominate our daily lives. These firms have grown rapidly, in some cases by scooping up smaller innovative firms, adding to their already-large market share in their respective industries. The tech giants have not helped themselves in this debate by invading privacy on an unprecedented level, failing to secure their users' personal information, allowing their platforms to be used by foreign powers, enabling the dissemination of fake and misleading stories, and driving small retailers out of business. These firms also use their financial resources to prevent legislation that might constrain them. Critics are now proposing that these firms be broken up or regulated. The cultural and regulatory honeymoon for Big Tech firms is coming to an end. Are these firms too big, too powerful, and too injurious to the public good?

These questions are not new in the United States or elsewhere in free market economies and involve defining what constitutes unfair, "monopolistic" competition; restraint of trade; and monopolistic behavior of firms as well as assessing the consequences of monopoly on consumer prices, quality, variety, and innovation. Additional political and social issues include the ability of small businesses to compete with very large businesses and how to ensure that concentrations of economic power lead to socially desirable outcomes rather than a concentration of political power that might overwhelm the voices of small businesses and individuals in the political process. See the end-of-chapter case *Are Big Tech Firms Getting "Too Big"?* for a more detailed examination of these issues.

8.5 PUBLIC SAFETY AND WELFARE

Governments everywhere claim to pursue public safety, health, and welfare. This effort produces laws governing everything from weights and measures to national highways and to the content of radio and television programs. Electronic media of all kinds (telegraph, telephone, radio, and television) have historically been regulated by governments seeking to develop a rational commercial telecommunications environment and to control the content of the media—which may be critical of government or offensive to powerful groups in a society. Historically, in the United States, newspapers and print media have been beyond government controls because of constitutional guarantees of freedom of speech. Electronic media such as radio and television, on the other hand, have always been subject to content regulation because they use the publicly owned frequency spectrum and hence come under a variety of federal laws and regulatory agencies, primarily the FCC. Telephones have also been regulated as public utilities and "common carriers," with special social burdens to provide service and access but with no limitations on content.

In the United States, public safety and welfare issues with respect to the online environment include concerns about the impact of harmful content, particularly on children and teenagers, the protection of public health through restricting sales of cigarettes and drugs, and efforts to control gambling.

PROTECTING CHILDREN

Through the years, major legislative efforts have been directed at limiting exposure of children to online pornography. To control the Web as a distribution medium for pornography, in 1996, Congress passed the Communications Decency Act (CDA). This Act made it a felony criminal offense to use any telecommunications device to transmit "any comment, request, suggestion, proposal, image, or other communications which is obscene, lewd, lascivious, filthy, or indecent" to anyone, and in particular, to persons younger than 18 years of age (Section 502, Communications Decency Act of 1996). In 1997, the Supreme Court struck down most of the CDA as an unconstitutional abridgement of freedom of speech protected by the First Amendment. Although the government argued that the CDA was like a zoning ordinance designed to allow "adult" websites for people 18 years of age or older, the Court found that the CDA was a blanket proscription on content and rejected the "cyberzoning" argument as impossible to administer. As previously discussed in the *Insight on Business* case, one section of the CDA that did survive scrutiny, Section 230, provides immunity for providers and users of interactive computer services (such as ISPs and websites) from being considered publishers that might be liable for harmful content posted by others. This is the law that allows social networks, blogs, and online bulletin boards to operate without fear of being held liable for online defamation or libel.

In 2001, Congress passed the Children's Internet Protection Act (CIPA), which requires schools and libraries in the United States to install "technology protection measures" (filtering software) in an effort to shield children from pornography. In 2003, the Supreme Court upheld the CIPA, overturning a federal district court that found that the law interfered with the First Amendment guarantee of freedom of expression. The Supreme Court, in a 6–3 opinion, ruled that the law's limitations on access to the Internet posed no more a threat to freedom of expression than do limitations on access to books that librarians choose for whatever reason not to acquire. The dissenting justices found this analogy inappropriate and instead argued that the proper analogy was of librarians purchasing encyclopedias and then ripping out pages that they thought were or might be offensive to patrons. All the justices agreed that existing blocking software was overly blunt, unable to distinguish child pornography from sexually explicit material (which is protected by the First Amendment), and generally unreliable (Greenhouse, 2003). The difficulty of identifying and removing pornography from the Internet is exemplified by Facebook's experience. Posting pornography is a violation of Facebook's Terms of Service, and it has removed thousands of pornographic postings and deleted the accounts of posters. Nudity is prohibited, as are suggestive images (which are undefined). But even with its advanced algorithms, assisted by human editors, Facebook routinely has eliminated museum-quality, legitimate works of art.

Other legislation, such as the Domain Names Act, seeks to prevent unscrupulous website operators from luring children to pornography by using misleading domain

names or characters known to children. The Protect Act is an omnibus law intended to prevent child abuse and includes prohibitions against computer-generated child pornography.

But pornography isn't the only kind of harmful online content. Much has been written about the challenges that the Internet, mobile apps, and social media pose for mental health, particularly that of children and young adults. The impact of the increase in screen time and time spent with digital devices during the Covid-19 pandemic has further highlighted this issue. Potential negative impacts include increased exposure to negative online social interactions (cyberbullying, feelings of missing out, and social comparisons); reduced physical activity; sleep disruption; isolation from in-person contact; and the possibility of Internet/social media addiction. For example, researchers have found that the social media content on Instagram can be harmful to mental health, particularly that of teenage girls. The state of California has taken the lead here and passed a landmark law, the California Age-Appropriate Design Code Act, that will require online services likely to be used by minors to consider their physical and mental health in the design of such services. The law will go into effect in 2024. The metaverse (see Chapter 3) is the next frontier, and concerns are already emerging about its potential impact on safety and well-being. The *Insight on Society* case, *Immersed in the Metaverse: Will It Be Safe?*, examines this topic.

CIGARETTES, DRUGS, AND GAMBLING: IS THE WEB REALLY BORDERLESS?

In the United States, both the states and the federal government have adopted legislation to control certain activities and products in order to protect public health and welfare. Cigarettes, medical drugs (and of course addictive recreational drugs), and gambling are either banned or tightly regulated by federal and state laws. Yet these products and services can often be found and purchased online. Because sites offering these products and services can be located offshore, they can operate beyond the jurisdictions of state and federal prosecutors. Or so it seemed until recently.

Cigarettes

In the case of cigarettes, state and federal authorities have been quite successful in shutting down tax-free cigarette websites within the United States by pressuring PayPal and credit card firms to drop cigarette merchants from their systems. The major shipping companies—UPS, FedEx, and DHL—have been pressured into refusing shipment of untaxed cigarettes. Philip Morris has also agreed not to ship cigarettes to any resellers that have been found to be engaging in illegal Internet and mail order sales. However, a few offshore websites continue to operate using checks and money orders as payments and the postal system as a logistics partner, but their level of business has plummeted as consumers fear that state tax authorities will present them with huge tax bills if they are discovered using these sites. The Prevent All Cigarette Trafficking Act, passed in 2010, restricts the sale of untaxed cigarettes and other tobacco products over the Internet and bans the delivery of tobacco products through the U.S. mail. Recently, concern over health issues related to e-cigarettes and vaping has given rise to state and local laws and regulations restricting online sales, with federal legislation also on the horizon.

INSIGHT ON SOCIETY

IMMERSED IN THE METAVERSE: WILL IT BE SAFE?

In October 2021, Facebook made a surprising announcement. It was changing its name to Meta to underscore what it believes will be the future not only of Facebook but of the Internet as a whole: a digital reality known as the metaverse. The metaverse has its roots in current technologies, such as virtual reality (VR), augmented reality (AR), and avatar-based virtual worlds, and envisions a 3-D virtual reality in which users can connect, socialize, collaborate, and transact. Although Facebook's announcement has kicked off a well-spring of hype, buzz, and interest, it also raises some serious questions about the potential impacts that the metaverse may have on public safety and welfare.

Mark Zuckerberg, Facebook's founder and CEO, believes that the metaverse is the ultimate expression of social technology. He characterizes the metaverse as an "embodied Internet," where, instead of just viewing content in 2-D, you experience being "in it," just as if you were physically present. Zuckerberg likens a fully realized metaverse to a teleportation device. Although VR, AR, and metaverse-like experiences are currently being used primarily for gaming and advertising, Zuckerberg and others believe that the metaverse ultimately will create a profound change in the ways people experience online life and work.

The world is already grappling with a host of ethical, social, political, and legal issues related to current online practices and content. In a metaverse, those issues and risks are likely to be exacerbated, and new ones will likely be created.

Some of the simplest risks to describe are the physical ones. Meta's current health and safety warnings for its Oculus VR system provide a long list of potential physical risks, ranging from seizures to dizziness, nausea, vomiting and visual issues. It notes that symptoms can persist for hours after use. It also warns that frightening, violent, or anxiety-provoking content can cause a user's body to react as if the content were real. For instance, one researcher recounted the experience of her avatar getting punched in the face. Although she "knew" her body was safe in her office, she said her mind and body registered the punches as real. With many companies working on technology such as haptic gloves, which incorporate touch as an additional sensation in an immersive reality, physical harm in the metaverse is likely to feel even more "real."

Psychological impacts are potentially more complex. Immersion is a more potent experience than merely observing and interacting with 2-D content on a flat screen. It is possible that, similar to the impact of compulsive social media use, participating in an intensely immersive world will make some people prefer it to "real" life and let it replace behaviors that are healthy and supportive to mental health, such as appropriate exercise, engagement in real-life relationships, healthy sleep, and time spent outside.

The potential impacts on children and adolescents are particularly concerning. Research has shown a myriad of negative effects of social media, from bullying and harassment to self-esteem and body image issues, on children and adolescents. These negative effects are likely to be just as prevalent, if not more so, in the metaverse. For example, one researcher teamed up with the Sesame Street Workshop to use Grover as an avatar. Her findings suggest that young children are more likely to comply with commands from a VR character than commands from the same character in 2-D. The researcher noted that when watching on television, children

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often would hesitate, look at the researcher, and ask what they were supposed to do. But in VR, the children just did whatever Grover told them to do, without stopping or looking around.

Exposure to harmful content on these platforms is another issue. For instance, a study by The Center for Countering Digital Hate found that minors are regularly exposed to graphic sexual content, racist and violent language, bullying and other forms of harassment in various games, such as VRChat, that are accessed via Meta's Oculus VR platform, even though Meta has policies prohibiting these sorts of negative content and behavior. Re-creations of the 2019 Christchurch, New Zealand, shooting that are aimed at children have been found multiple times on the Roblox game platform despite efforts by Roblox to prevent such content.

The potential impact of the metaverse on privacy and government surveillance is another concern. The privacy issues are particularly acute because metaverse companies may track and retain users' biometric data as well as data about their actual actions and may ultimately be able to learn how users uniquely think and act. Tellingly, although Meta has stopped using facial recognition technologies on its Facebook platform, it continues to use these technologies on its Oculus VR platform. This information would be a treasure trove for both advertisers and governments.

Some believe that the concerns about the potential impact of the metaverse are overblown. These critics point to a long history of alarmist predictions when a new technology is introduced, with such predictions usually providing to be unfounded. Others point to the beneficial applications already developed for VR and AR that put those technologies' power to blur the line between the real and the virtual to good use, such as VR applications for treating phobias, nightmares, and PTSD; for enhancing education and the arts; and for building empathy, diversity, and inclusion, among other positive uses. Zuckerberg has said that safety, privacy, and ethics will be front and center in the metaverse's development and that because a full-fledged metaverse is still several years away, regulators and policymakers will have ample time to implement safeguards.

But how realistic is it to expect that industry self-regulation or even laws and regulations will be able to adequately address the issues likely to be posed by the metaverse? Safety policies cannot be simply transported from existing social media. Instead, specific policies for immersive environments based on how the technology interacts with our brains will be needed. Even these policies will be very difficult to monitor and enforce. Further, Meta's current business model is built on trying to engage user attention for as long as possible, making it more likely than not that its version of the metaverse will also evolve into something that focuses on hooking both kids' and adults' attention. Critics don't trust Meta to create a metaverse that protects people if doing so conflicts with Meta's business goals of maximizing profit, especially as it grapples with declining use of its Facebook platform.

SOURCES: "The Promise and Perils of the Metaverse," Mckinsey.com, March 29, 2022; "'This Is Creating More Loneliness: The Metaverse Could Be a Serious Problem for Kids, Experts Say," by Tom Huddleston, Cnbc.com, January 31, 2022; "Tech Companies Reveal Blueprint for a Safer Metaverse," by Gadjo Sevilla, Insider Intelligence/eMarketer, January 20, 2022; "How to Address Digital Safety in the Metaverse, " by Cathy Li and Farah Lalani, Weforum.com, January 14, 2022; "The Metaverse's Effect on Mental Health: Trivial or Troubling?" by Benoit Morenne, *Wall Street Journal*, January 9, 2022; "Law in the Metaverse," by Greenberg Glusker LLP, Jdsupra.com, December 27, 2021; "The Health Concerns that Hang Over the Metaverse," by Alexandra Levine, Politico.com, November 17, 2021; "If Social Media Can Be Unsafe for Kids, What Happens in VR?" by Catherine Buni, Slate.com, October 11, 2021; "Mark in the Metaverse," by Casey Newton, Theverge.com, July 22, 2021.

Drugs

The situation with respect to medically prescribed as well as illegal drugs is more complex. Although properly regulated Internet pharmacies offer a valuable service by increasing competition and access to treatments in underserved regions, industry researchers have found that 98% of online pharmacies don't require a prescription and that 40% of online pharmacies were selling dangerous synthetic opioids such as fentanyl. In many countries, trafficking in illegal prescription drugs now equals or exceeds the sale of heroin, cocaine, and amphetamines.

The sale of drugs without a prescription is not the only danger posed. Rogue online pharmacies may also be selling counterfeit versions of popular drugs. For instance, Interpol found that more than 10% of all medical products sold online are counterfeit, a situation that affects all regions of the world. The FDA has issued past warnings that consumers who had purchased Ambien, Xanax, and Lexapro online had instead received a product containing haloperial, a powerful anti-psychotic drug.

Despite these dangers, online pharmacies remain alluring, particularly for older adults. Typically, online pharmacies are located in countries where prescription drugs are price-controlled or where the price structure is much lower, such as Canada, the United Kingdom, and European countries as well as India and Mexico. U.S. citizens can often save 50%–75% by purchasing from online pharmacies located in other countries. Currently, a patchwork regulatory structure governs the sale of drugs online, but laws requiring a doctor's prescription to purchase medicine and restricting the purchase of drugs online are virtually unenforceable because foreign online pharmacies can easily run their websites from an offshore location, making it difficult for federal and state authorities to exercise jurisdiction over them.

Another haven for online purveyors of illegal drugs is the "darknet," which consists of sites that are not accessible by search engines and that often feature security measures designed to promote anonymity or to mask illegal activity. Known as darknet marketplaces, these sites require users to run special software to mask users' IP addresses and accept only cryptocurrencies like Bitcoin to further protect user privacy (see Chapter 5). According to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), most sales on darknets are related to drugs, and such sales are responsible for more than 90% of the total economic revenue of darknets worldwide.

Although law enforcement agencies in various countries have worked together to shut down darknet marketplaces and are frequently successful in doing so (for instance, shutting down the infamous Silk Road in 2013 and the AlphaBay and Hansa marketplaces in 2017), invariably as one market closes, others pop up to take its place. There are fewer risks to personal safety and violence when buying drugs online compared to in person from drug dealers, and as governments attempt to crack down on popular opioids (for example, when the United States moved certain opioids into a more restrictive category of classification, making them far more difficult to acquire), many users have flocked to darknet marketplaces to compensate for the difficulty of acquiring these drugs. Online drug dealers and the darknets that support them have proved to quite resilient, and the battle of law enforcement to control them is likely to continue for the foreseeable future.

Gambling

Gambling also provides an interesting example of the clash between traditional jurisdictional boundaries and claims to a borderless, uncontrollable Web. In the United States, gambling of all kinds is largely a matter of state and local laws, but in 2006, Congress passed the Unlawful Internet Gambling Enforcement Act (UIGEA), which prohibited financial institutions from transferring funds to or from Internet gambling sites but did not remove from the states the ability to regulate gambling of all kinds. Although online gambling per se is not prohibited by this Act and although no person has ever been arrested for online gambling, this legislation initially decimated the online gambling industry within the United States. The U.S. Department of Justice enforced the law vigorously, denying offshore operators access to U.S.-based payment systems, seizing assets, shuttering the operators' U.S. business, and arresting several executives. Online gambling sites moved to alternative currencies, such as cryptocurrencies, which are not regulated by the UIGEA, thus enabling these sites to sidestep the law (Legalsportsbetting.com, 2019). The mood has also changed in the last several years. State revenue needs have grown, and many in the casino gambling industry have switched sides and now support online gambling, seeing it as a revenue-growth opportunity. The ethical issues surrounding online gambling now have less influence on the public debate than does the need for new tax revenues and, for firms, the hope for additional revenues.

In 2012, Delaware became the first state to legalize online gambling on casino games and poker, and six other states have followed: Michigan, New Jersey, Pennsylvania, West Virginia, Connecticut (online casino games only), and Nevada (online poker only). Online gambling is also legal in the U.S. Virgin Islands (PlayUSA, 2022).

Until 2018, real-world sports betting outside of authorized venues such as horse racetracks, was illegal in the United States. States were specifically prohibited by the Professional and Amateur Sports Protection Act (PASPA) from authorizing sports betting and, therefore, could not garner tax revenues from what became a $150 billion illegal industry, a significant portion of which was taking place online. In 2018, the Supreme Court found that the PASPA was unconstitutional and for the first time allowed states to authorize and tax sports betting, including online sports betting. New Jersey was the first state to legalize online sports betting and has since been joined by 21 other states plus the District of Columbia. Revenue from online sports betting is projected to grow to $37 billion by 2025, generating millions to billions in tax revenue for the states in which it is legal (Play USA, 2022; Liptak and Draper, 2018).

Fantasy sports is also exploding. Two firms dominate the online fantasy sports market: DraftKings and FanDuel, both of which are major players in online sports betting as well. In fantasy sports, players assemble their ideal fantasy teams, draft real-life athletes to their team, and then, based on the performance of those players in real games, win significant prizes. The most popular fantasy sports are college football and basketball and professional football and baseball. Players are given a budget that they can use to draft players, and some of the combined fees for each game make up the pool for which players compete. Entry fees range widely from less than a dollar to more than $1,000.

Fantasy sports were exempted from the UIGEA as a result of industry pressure. The industry argued that participating in fantasy sports is not gambling but, instead, a game

of skill like chess or Scrabble. As the industry grew to billion-dollar venture capital valuations, however, and with allegations of cheating customers, deceptive practices, lack of transparency, and insider irregularities, state and federal legislators are holding hearings and considering regulations. Initially, the New York State attorney general tried to halt fantasy sports in New York on the grounds that it constituted illegal gambling. After lengthy legislative hearings and strong support from sports fans, New York reversed its position, and legislation was enacted that legalized fantasy sports as a state-regulated industry. In 2020, however, a New York State court ruled that the law legalizing fantasy sports violated the New York State Constitution's ban on gambling. However, after continued litigation, New York's top court finally ruled in March 2022 that fantasy sports is a game of skill, not gambling, and therefore does not violate the New York State constitution (Hill, 2022).

8.6 CAREERS IN E-COMMERCE

This chapter provides you with an overview of the major ethical, social, and political issues involving the Internet and e-commerce. Companies are becoming increasingly aware that such issues can have a significant impact on their bottom line. Jobs that specifically deal with these issues can typically be found in a company's compliance department, but awareness of these issues is also necessary for all employees of a company.

THE COMPANY

The company operates a global online advertising exchange platform that connects websites that have inventory (web publishers who have space on their websites where ads can be displayed, also called "ad opportunities") with buyers (firms that want to advertise). Consumer behavior data is collected by the websites and made available to buyers, who may add their own consumer information to the mix. The platform allows buyers to choose specific market segments (e.g., Millennial parents interested in purchasing a house). The platform's analytics helps buyers decide how much to pay for the inventory and make bids for the inventory and also tracks the performance of the resulting online ads. The company has 20 offices in the United States and in four other countries. The firm has 700 employees, serves 4,000 advertisers, analyzes 500 billion online ad opportunities daily, and serves more than 150 million ads for its marketing customers each day. The company manages this complex process of finding and selling ad opportunities using machine learning that looks for patterns in the data and tries to identify the most likely consumers who will click on a specific ad. All of this takes place in milliseconds.

Advertising exchanges or platforms are the basis of programmatic advertising, where marketing firms sell or match ad opportunities on publisher websites or social networks to firms seeking to display ads targeted to very specific segments. Programmatic advertising is now the most widely used method of buying and selling digital display ads on both desktop and mobile devices. The growth in this market is a product of convenience, speed, and precision in finding the best advertising opportunities for firms.

POSITION: E-COMMERCE PRIVACY RESEARCH ASSOCIATE

You will be working remotely with the Compliance Department to ensure privacy and data protection compliance while enabling business innovation. The position involves researching privacy, domestic, and international regulations and policies and also industry best practices. Your responsibilities include:

- Monitoring, digesting, and developing written summaries of proposed and enacted legislation, regulations, court decisions, industry guidelines, trade journals, and other relevant publications in privacy, cybersecurity, information security, and technology.
- Researching federal, state, and international laws and regulations related to data security, information security, and privacy, including laws related to compromised data and security breach incidents. Additional areas may include laws and regulations related to online marketing, social media, e-commerce, and technology.
- Researching global data protection and privacy compliance in the online advertising market, drawing on your knowledge and experience of specific government/industry requirements and best practices.
- Analyzing existing and developing products and solutions to ensure they comply with applicable privacy and data protection laws and industry best practices.
- Guiding and supporting lines of business on legal and regulatory requirements that are related to compromised data incidents, privacy, and cybersecurity.
- Reviewing contracts with vendor and customer firms to ensure compliance with privacy regulations and industry best practices.
- Developing educational and training materials for business client groups and other divisions of the firm.

QUALIFICATIONS/SKILLS

- B.A. in the humanities, business, information systems, marketing, or political science, with course work in e-commerce, statistics, business strategy, and digital marketing
- Basic understanding of privacy and privacy law in the United States and how they relate to online digital advertising
- Interest in international business and data protection laws in the European Union, Latin America, and Asia/Pacific
- Knowledge of the digital marketing industry, software service platforms, and programmatic advertising platforms
- Excellent written and oral communication skills, including a clear and concise drafting style
- Strong research skills
- Excellent customer service and interpersonal skills
- Exceptional analytical and problem-solving skills, with the ability to think strategically and provide business advice
- Advanced Microsoft Office (Word, Excel, Outlook, and PowerPoint) skills
- Strong organizational skills, including the ability to manage timelines and balance multiple deadlines while working remotely
- Comfortable with desktop and mobile technology and an active user of online or mobile applications and social networks

PREPARING FOR THE INTERVIEW

To prepare for this interview, re-read the sections of this chapter that address the responsibilities for the position identified by the company. In this case, the position requires familiarity with privacy legislation and regulation in both the United States and the European Union, which is covered in Section 8.2. Also review the opening case and the *Insight on Technology* case. It will also be worthwhile to do some background research on the firm and the industry in which it operates (see the closing case study in Chapter 6, which discusses the programmatic advertising industry).

POSSIBLE FIRST INTERVIEW QUESTIONS

1. We're looking at candidates who have an interest in the protection of consumer privacy but who also understand the need for our clients to communicate with online consumers. What's your experience with your own sense of your privacy when online, and why do you think consumers are concerned about their online privacy?

You can start with the last question: Consumers are concerned about their privacy because they typically do not know or understand what happens to their personal information online, and they feel they have no control over how it is used. Second, you could discuss how you feel about protecting your privacy on social networks such as Facebook. Facebook does provide a number of tools for limiting the personal information that other users can see, and it is really up to individuals to use those tools. On the other hand, Facebook's tools can be confusing to understand, and many users still feel that they do not really control who sees their postings, or how the information is being used by Facebook or advertisers.

2. Aside from tools provided by various social networks, what are some of the software and tools that consumers are using to protect their privacy online? Do you think any of these tools might interfere with our programmatic marketing business?

You could describe some of the tools that you or your friends may have used or considered using to protect your privacy while browsing or messaging. You could discuss tools such as Apple's App Tracking Transparency and Intelligent Tracking Prevention, anonymous browsing and privacy default browsers, cookie managers, encrypted e-mail, anti-tracking tools, and ad blockers. Anonymous browsing software, anti-tracking tools, and ad-blocker tools are becoming more popular among sophisticated users, and, yes, these tools probably do interfere somewhat with online marketing campaigns.

3. How do you think our industry and firm should respond to the growing use of these tools and the public's concerns about online privacy?

You could answer this by mentioning programs developed by the online advertising industry, such as Network Advertising Initiative (NAI), that certify that firms have adopted industry privacy standards and best practices. Two practices stand out: the NAI's global opt-out website, which allows consumers to avoid tracking and cookies from specific sites, and the AdChoice program, which gives users a better sense of how their

information is being used and the ability to turn off certain ads that are inappropriate. These efforts give users some degree of control over what information is collected and how that information is used. In addition, there are several companies that offer privacy management software that helps firms understand how they are meeting industry best practices, such as the OneTrust Privacy Management Platform.

4. Our firm receives large quantities of consumer online behavioral data that we use to display ads for our clients. We do not know the personal names of these consumers or their specific addresses, and these consumers are identified only by an assigned number and, of course, their online behavior and basic demographic information. Is our collection of this data an invasion of consumer privacy?

You could suggest that many online consumers do believe they are personally identifiable online by name, address, and geo-location even if they are not. For instance, online tracking of consumers from one website to another gives many the impression that they are personally being watched as they browse. They do not understand that they are known only as a cookie number or as a customer number. Facial recognition technology, however, is very personal and raises new concerns.

5. We have many clients that operate in the European Union, which has very different privacy laws and data protection regulations than those in the United States. What do you think are some of the key differences between European and U.S. privacy regulations and laws?

You can suggest that one major difference is that the European Union has a general privacy law (the GDPR) that requires a default opt-out option from tracking or placing cookies and requires users to explicitly opt in to tracking, cookies, and other ways of following people online. European countries have data protection agencies that enforce privacy laws, but the United States does not, although certain states, such as California, have recently enacted similar laws that operate on a state level. The GDPR also gives users the ability to have certain information removed from search engines.

8.7 CASE STUDY

Are Big Tech Firms Getting "Too Big"?

Want to connect with friends? It's Facebook or Instagram, both owned by the newly renamed Meta. Search for something online? Google, what else? Shop online? It's Amazon. Critics argue that Amazon, Google, and Meta have built almost-impregnable digital platforms that restrict entrance to competitors, reduce competition, and provide extraordinary pricing power, enough to crush competitors. Critics further claim that Big Tech will do anything, including pay absurd acquisition prices, to stifle competition and to preserve their monopoly positions. In the United States, critics say antitrust regulators and politicians don't get it: It's not about consumer welfare or prices. The strategy of Big Tech firms is to aggregate huge user numbers by eliminating competitors, especially smaller startups.

In order to understand the current situation, first you must understand a little bit about the history of antitrust regulation in the United States. Beginning with the Sherman Antitrust Act in 1890 through the 1950s, Congress passed multiple pieces of legislation to restrain and, if necessary, break up the industrial giants of the nineteenth and twentieth centuries. The purpose of this legislation was to ensure that small firms and entrepreneurs could enter markets; to define and prevent anti-competitive practices; and to protect consumers and other firms from exorbitant prices and, in short, any behavior that resulted in a *restraint of free trade*. Legislators believed that restraint of

free trade would ultimately lead to lower product quality, reduced or restricted production and supply, and less innovation. Although this legislation did not precisely define "monopoly," it did refer to a situation in which a single firm, or group of firms, dominated an entire industry and, importantly, engaged in behaviors intended to restrict competition and free trade and to maintain that dominance. Dispersion of both economic and political power was a central aim of early antitrust legislation.

Sheer size and market power (market share) were considerations in determining what exactly a monopoly was. "Bigness" was, in general, suspicious, although "bigness" per se was not by itself a criterion for monopoly. More important were concrete actions taken by powerful companies to harm the market environment for competitors as well as the structure of the industry, in particular the vertical integration of the supply chain that prevents competitors from even starting a new business in the industry.

The classic antitrust case is *Standard Oil Co. of New Jersey v. United States* (1911). John D. Rockefeller was a co-founder of the Standard Oil Trust. Over a period of 30 years, the Trust grew to control oil exploration, transportation (pipelines and railroads), refining, and distribution down to the retail level, thus dominating the marketing of oil products. This is called *vertical integration*, or taking control of the supply chain for an entire industry. One result of Standard Oil's behavior was complete control of the pricing of oil products, enabling it to charge below-cost prices in some markets in order to bankrupt its competitors and simultaneously charging monopoly-high prices in markets where it faced no competition (called *predatory* or *discriminatory pricing*).

In 1911, the Supreme Court ruled that Standard Oil was in violation of the Sherman Antitrust Act and mandated a change in the structure of Standard Oil by breaking it up into 34 separate firms that the Court hoped would compete with one another and remain independent, as well as by proscribing the firm from other practices with the intent of establishing new monopolies. Several of these firms have recombined with one another over the last hundred years and today form a large part of the ExxonMobil Corporation, the largest oil company in the United States.

Antitrust laws and court decisions recognized that some monopolies, when they resulted from simply being the most efficient producer of high-quality products sold at competitive prices, were "innocent" and legal. In other cases, where the very nature of the product and the market required very large initial capital investments, with few rewards in the short term until a large scale was attained, dominant firms were considered *natural monopolies*. Electrical and gas utilities, telephone and cable systems, and railroads all have very high initial investments that can be justified only by capturing a large share of a market. Often these firms are the first to develop a technology and thus achieve a *first-mover advantage*. Natural monopolies create barriers to entry into a market simply by virtue of the investment size required for new entrants as well as other nearly insurmountable advantages in efficiency, brand, and patents.

Both innocent and natural monopolies may engage in anti-competitive behaviors that are not in the public interest because they control, as do all monopolies, the market, including pricing, quality, and supply of the product or service. In these cases, in addition to structural changes, legislatures have turned to regulation to control pricing and service levels in the public interest. For instance, in the early twentieth century, the federal government nationalized the entire telephone and telecommunications

industry, with the intent of creating a single national system operated by a single firm, AT&T. The following year, states took over regulation of the industry, including prohibiting new companies from competing and introducing new standards and competing telephone lines to prevent duplication and higher prices. Even telephone handsets had to be produced solely by AT&T's equipment firm, Western Electric. The theory was that the national telephone service required a single provider that could provide efficient service to the entire country. Later in the 1980s, with the evolution of new devices and new technology such as microwave communications, which did not require huge capital investments, courts broke up AT&T into seven regional Bell operating companies, allowing competitors to provide telephone service and equipment to the market.

Antitrust thinking changed markedly during the 1960s due to changes in economic thinking and interpretation by courts as well as changes in the economy and politics. In this period, concentration of economic power was not seen as anti-competitive but, instead, was believed to lead to greater efficiency and lower prices for consumers. During this time period, courts viewed the practice of dropping prices as an example of "price competition," not "predation," and therefore not an illegal restraint of trade. In this view, the only criterion that should be used when assessing the behavior of large firms—or when considering the mergers of large firms into truly giant firms—was economic efficiency and consumer prices.

Similarly, buying up key firms in the supply chain was re-thought of as leading to greater efficiency for firms, not as evidence of restraint of trade or preventing new players from entering a market. Firms that "integrated" their production through vertical integration were more efficient than firms that did not integrate. Moreover, as firms gained efficiency, it was believed that they would pass these benefits on to consumers in the form of lower prices. After the 1960s, the major constructs of classical antitrust thinking and legislation—predatory pricing, discriminatory pricing, and vertical integration—were no longer viewed as problematic, but rather seen as advancing consumer interests by lowering prices. This new thinking was directly opposite of earlier antitrust thinking and laws.

Fast-forward to the twenty-first century. Amazon is an example of a firm that does not fit the rational model of 1960s antitrust thinking. Amazon's strategy has been to focus on maximizing market share, not profits, and therefore it is willing to price retail products at or below cost for long periods of time, not just for holiday sales. It is able to do this in part because private capital and public markets were willing to provide low-cost financing in the form of extraordinarily high stock prices despite Amazon's failure for many years to show a profit. Amazon now operates the largest online retail platform, with more than 12 million products, from shoes, dresses, batteries, books, to computers and wrenches. It is the largest third-party online market platform in the United States, with almost 3 million third-party merchants. As a result, it has an unprecedented trove of information on consumer behavior and the pricing of goods sold by merchants on the platform. Amazon has at least 10 lines of business aside from retailing, including web services (Amazon Web Services [AWS]), movie and TV production, fashion design, book publishing, and hardware manufacturing. With multiple lines of business, Amazon has been able to drop prices below cost in one line of business, such as books, in order to support another line of business, such as its sales of Kindle readers and tablet computers.

It has been willing to run its retail operation at a loss, or break-even, as other lines such as AWS make the lion's share of its profits. Amazon uses its pricing algorithms to change prices on thousands of goods several times a day. For the most part, neither the public nor government regulators can track these price changes or their impact on competitors and merchants.

For instance, in 2007, Amazon began selling e-books at $9.99, below their cost to Amazon, rather than at the traditional publisher price of $14.99, in part to subsidize its Kindle readers. Hachette, a major book publisher, objected to this practice. Amazon, in turn, refused to continue listing Hachette's books on the Amazon platform. In other product lines, Amazon has developed its own house brands, such as Amazon Basics (household goods and electronics), Amazon Essentials (clothing), Amazon Elements (vitamins and supplements), and Amazon Collection (jewelry), based on its platform knowledge of sales volumes, revenue, and estimated profitability. One of the worst fears of Amazon's merchants is that Amazon may decide to develop its own competing products. In 2019, Amazon was forced to admit during testimony before the U.S. Congress that it uses aggregated data drawn from third-party sellers to develop and promote its own branded products, and a *Wall Street Journal* investigation revealed that Amazon uses proprietary data collected from individual third-party sellers as well. Amazon's familiar recommender system ("people who bought this also bought this") highlights Amazon's private-label brands when available, and another *Wall Street Journal* investigation revealed that Amazon adjusted its search algorithm to highlight its private-label items that are more profitable for the company rather than the most-relevant and best-selling listings. In 2022, Amazon is reportedly considering drastically reducing the number of items it sells under its own brands and possibly even totally exiting the private-label business entirely to alleviate regulatory pressure. In Europe, the European Commission has filed antitrust cases against Amazon on the grounds that it is abusing its role as a seller of its own products while at the same time operating a third-party marketplace. In an effort to settle the cases, Amazon has offered to pledge not to use non-public data about sellers on its marketplace. In the United States, Amazon faces multiple antitrust probes as well, including from Congress, the Department of Justice, the FTC, and several states.

Meta faces similar criticism of using its platforms to destroy or buy its competitors. In 2012, two companies, Instagram and WhatsApp, were growing more quickly than it was. After failing in its efforts to build effective competing services, Meta bought Instagram for $1 billion, and in 2014, it bought WhatsApp for an astounding $21.8 billion. Overall, Meta has acquired more than 90 different companies. In 2016, Meta developed a live video app and put popular Meerkat, the market-leading startup, out of business. The rise of Snapchat provides another example. Snapchat's key feature is that it allows users to easily send photos and videos, with a focus on the camera instead of a keyboard. In 2013, Meta's offer to buy the firm was rejected. Shortly thereafter Meta created a copycat service called Instagram Stories that mimicked Snapchat's features. Since that time, the use of Instagram Stories has been growing at a significantly higher rate than that of Snapchat. Over time, Meta has also developed copies of Snapchat features in its other related services, Messenger and WhatsApp. The legal team of Snap (Snapchat's parent company) reportedly kept a dossier of all the ways it felt that Meta tried to undermine

Snap's business and has provided the dossier to the FTC as part of the FTC's broader antitrust investigation into Meta's business practices. In December 2020, the FTC filed an antitrust case against Meta on the grounds that its acquisitions and years-long course of anticompetitive conduct helped it maintain its dominance in the social media marketplace. The European Commission is also investigating Meta's alleged attempts to identify and eliminate potential rivals.

Critics identify Google as a monopoly not simply based on its market size but also on its horizontal integration behavior and its search engine's favoritism for its own services, which results in competitors' organic search results being placed lower on the first page or buried on back pages of results lists. Critics consider these behaviors to be a restraint of trade by eliminating Google's competitors with the intent to preserve its search and advertising dominance. Google's horizontal strategy follows the Big Tech playbook: buy up competitors or degrade their access to the Google search platform. Google purchased YouTube in 2006 for $1.6 billion after its own effort to create an online video hub, called Google Videos, failed to gain an audience. In 2008, Google bought DoubleClick, one of the online advertising network pioneers, for $3.1 billion. Google bought Waze in 2013 for $1 billion because it was a popular rival to Google Maps due to the former's graphical mapping interface. Apple, a distant second but still a threat, is the only remaining competitor in online mapping.

When comparison shopping services directing users to lowest-price websites grew in popularity and competed with Google's plans for a shopping service, Google reduced the ranking of those sites on the Google search results pages. This happened with Foundem, a UK-based comparison shopping service that steered users to the lowest online prices; Foundem competed with Google's Froogle (now called Google Shopping). When Foundem started catching on, Google changed its search algorithm so that Foundem did not show up on the first page of search results but was instead buried in later pages or disappeared altogether. A similar fate happened to TradeComet, KinderStart, NextTag, and other comparison shopping services, all of which complained to the European Commission and the FTC. In 2017, after a seven-year investigation, the European Commission fined Google $2.8 billion for abusing its market-dominant search engine by demoting competing comparison shopping services to, on average, the fourth page while showing its own Google Shopping images at the top of the first page. Google defended its actions by arguing that these sites were link farms (aggregators of other content on the Web) and were therefore a violation of Google's search algorithm rules, which punish sites that don't have original content but just link to other sites. But the European Commission responded that Google Shopping's results also were mostly content provided by other sites, usually advertisers who paid for the top listing. In 2021, a European court upheld the fine, dismissing Google's appeal.

Similarly in 2009, Google tried to buy Yelp, a consumer review site with a following in the millions, but was rejected. Suddenly Yelp found that its local reviews were no longer listed as first or second on Google but down the page, whereas Google's paid ads came up first, even when those ads did not contain any reviews or original content other than ads for restaurants. Later Google started pulling Yelp content into its own results so that users did not have to visit Yelp at all. Getty Images had a similar experience. In 2013, Getty Images lost 85% of its traffic when Google started directing searches for images

directly to its own search engine rather than to Getty Images. Both firms experienced reduced revenues because of Google's actions.

In October 2020, the Department of Justice and the Attorneys General of 11 states, citing the Sherman Act, filed a lawsuit against Google based on its anti-competitive behavior, in terms of its dominant market power in both search and search advertising, where Google owns dominant technology tools at almost every layer of the "supply chain." In August 2022, the Department of Justice was reportedly getting ready to file a second lawsuit against Google based on Google's anti-competitive behavior in the digital advertising marketplace. In an effort to fend off the suit, Google has reportedly offered to split off its ad technology business into a separate company.

Amazon, Meta, and Google are among the most popular online services. People love them and use them daily. Because Google and Meta do not charge users for their services, they cannot be accused of reducing consumer welfare by increasing prices. Therefore, they cannot be accused of predatory pricing or discriminatory pricing. If anything, for the same zero cost to consumers, these firms have increased their usefulness to consumers and have substantially increased consumer welfare. Amazon is often a price leader in both online and offline retail, is extraordinarily easy to use, provides unprecedented variety and choice, and has more than 50% of the U.S. Internet audience in its loyalty program, Amazon Prime. As long as consumer welfare (price) is the single criterion of regulating monopolies, these firms are then acceptable on antitrust grounds.

However, if the core principle behind antitrust legislation is to protect and encourage competition by limiting the ability of dominant corporations to damage their smaller competitors and reduce consumer choice, then Big Tech firms may be liable on the grounds of limiting competition; denying opportunities for new entrants; discouraging new, innovative companies from even trying to enter markets; and, as a result, creating an anti-competitive market environment and restraining trade. However, new concepts and new laws and regulations would be needed to make these behaviors of Big Tech explicitly illegal.

One conceptual change would be to view these firms as platforms providing access to audiences and capturing consumer time on site rather than as traditional businesses selling products and services. Big Tech firms are not the traditional businesses of the nineteenth and twentieth centuries. Rather, these firms are excellent examples of network effects: the larger the number of users, the greater the value. The market value of Meta, Google, and Amazon lies in their online audience size and their dominance of users' online time. However, the question remains: How much is "too much" mindshare? Is it 30%, 50%, or 90%? Congress, federal regulators, and jurists will have to decide the answer to this question.

In this line of reasoning, one possible solution to Big Tech's dominance is to increase the review of proposed mergers with the goal of protecting innovative small firms from being purchased if these mergers would result simply in the dominant firm gaining larger audiences and capturing more of the consumers' time, thus denying this mindshare from competitors. Mergers that are not truly horizontal mergers, such as Meta's purchase of WhatsApp, which was not in the social network market per se, could be prevented on the grounds that the merger would simply increase market mindshare for Meta and hinder the ability of innovative startups to enter the market.

SOURCES: "DOJ Is Preparing to Sue Google over Ad Market as Soon as September," by Leah Nylen and Gerry Smith, Bloomberg.com, August 9, 2022; "Amazon Has Been Slashing Private Selection Amid Week Sales," by Dana Mattioli, *Wall Street Journal*, July 15, 2022; "Amazon Proposes Settlement of EU Antitrust Charges on Seller Data," by Kim Mackreal and Sam Schechner, *Wall Street Journal*, July 14, 2022; "Google Offers to Split Off Part of Ad Business to Avoid Antitrust Lawsuit," by Doug Isenberg, Giga.law, July 11, 2022; "Long, Costly Road ahead for FTC Antitrust Case against Meta," by Makenzie Holland, Techtarget.com, April 7, 2022; "Google Loses Appeal of $2.8 Billion Fine in E.U. Antitrust Case," by Adam Satariano, *New York Times*, November 10, 2021; "How Amazon Wins: By Steamrolling Rivals and Partners," by Dana Mattioli, *Wall Street Journal*, December 22, 2020; "Amazon Faces New EU Antitrust Charges," by Valentina Pop and Sam Schechner, *Wall Street Journal*, November 10, 2020; "Justice Department Sues Google, Alleging Multiple Violations of Federal Antitrust Law," by Tony Romm, *Washington Post*, October 20, 2020;" "Amazon to Face Antitrust Charges from EU over Treatment of Third-Party Sellers," by Valentia Pop and Sam Schechner, *Wall Street Journal*, June 11, 2020; "Amazon Scooped Up Data from Its Own Sellers to Launch Competing Products," by Dana Mattioli, *Wall Street Journal*, April 23, 2020; "EU Deepens Antitrust Inquiry into Facebook's Data Practices," by Sam Schechner, Emily Glazer, and Valentina Pop, *Wall Street Journal*, February 6, 2020; "Amazon Admits to Congress that It Uses 'Aggregated' Data from Third-Party Sellers to Come Up with Its Own Products," by Lauren Feiner, Cnbc.com, November 19, 2019; "How Google Edged Out Rivals

A second solution regarding existing monopolies would be to split them up into stand-alone, independent companies. Amazon could be split into 10 stand-alone companies, such as a retail company, a web services company, a media company, a logistics firm, and others. Meta could likewise be split into several companies, such as one focused on social networks, one focused on messaging, and a third focused on virtual reality. Google could be split into a search advertising network, a computer hardware company, and a video-sharing company. Instead of three oligopolies, numerous independent companies would be created. The merger policy described could then be used to prevent these firms from combining again into monopolies or oligopolies.

A third solution follows the European method of dealing with Big Tech mega-firms. The European Union is pursuing a regulatory model for Big Tech firms in a number of areas such as antitrust, privacy, and taxation. In the antitrust area, the focus is on the anti-competitive behavior of big firms and the use of meaningful fines for violations of competitive laws and regulations. For instance, the European Union fined Google a record $5.1 billion in 2018 for forcing Samsung, Huawei, and other smartphone makers to prioritize Google search, its Chrome browser, and other Google apps in return for allowing these smartphone makers to use the Android operating system. The regulators believe that Google did this in order to retain the dominance of its search engine advertising business and to deny rivals the chance to compete and consumers the benefits of a competitive market. In addition to the fine, the largest in history against a Big Tech company, Google was required to separate its Android system from its other apps, including Google Docs, the search engine bar, the browser, and potentially Google Store, Google Play, and Google Shopping. The penalty for violating this order can reach as high as 5% of Google's average daily global income, which could amount to billions of dollars. This decision followed the same playbook as was used in the 2017 decision to fine Google $2.8 billion for pushing its own products and services to the top of search engine results. In 2019, the European Commission fined Google yet again, this time for $1.7 billion, for abusing its dominance in search to limit competition with respect to a service called AdSense for Search, which involves the sale of text ads on search results that appear on third-party websites.

The European Union is further raising the stakes for Big Tech with the authorization of the Digital Markets Act (DMA), which is aimed at preventing "gatekeeper" platforms (defined on the basis of market value and including Google's parent, Alphabet; Meta; Amazon; Apple; and Microsoft) from exploiting their interlocking products and services to lock in their users and squash potential rivals. Once officially enacted, the law is expected to have a far-reaching impact on the operation of app stores, online advertising, e-commerce, and messaging services. U.S. critics of Big Tech hope that the passage of the DMA will provide a roadmap for the passage of similar legislation in the United States.

It is unclear which of these three kinds of remedies is most likely to succeed in the U.S. context. For the last 30 years, in the name of innovation and economic growth of a nascent industry, the federal government has taken a mostly hands-off attitude toward regulating the Internet and the growing concentration of Internet markets. However, the Internet industry is no longer nascent, but ascendant, and is increasingly accused of abusing its economic and political power. Conservative and liberal populist groups,

and Built the World's Dominant Ad Machine: A Visual Guide," by Keach Hagey and Vivien Ngo, *Wall Street Journal*, November 7, 2019; "Snap Detailed Facebook's Aggressive Tactics in 'Project Voldemort' Dossier," by Georgia Wells and Deepa Seetharaman, *Wall Street Journal*, September 24, 2019; "Amazon Changed Search Algorithm in Ways that Boost Its Own Products," by Dana Mattioli, *Wall Street Journal*, September 16, 2019; "FTC Antitrust Probe of Facebook Scrutinizes Its Acquisitions," by Brent Kendall, John McKinnon, and Deepa Seetharaman, *Wall Street Journal*, August 1, 2019; "Google Fined $1.7 Billion in EU for Restricting Rivals' Ads," by Sam Schechner and Valentina Pop, *Wall Street Journal*, March 20, 2019; "Why Do the Biggest Companies Keep Getting Bigger?" by Christopher Mims, *Wall Street Journal*, July 26, 2018; "Google Fined $5.1 Billion by E.U. in Android Antitrust Ruling," by Adam Satariano, *New York Times*, July 18, 2018; "The Case against Google," by Charles Duhigg, *New York Times*, February 25, 2018; "The Antitrust Case against Facebook, Google and Amazon," by Greg Ip, *Wall Street Journal*, January 16, 2018; "How to Curb Silicon Valley Power Even with Weak Antitrust Laws," by Nitasha Tiku, Wired.com, January 5, 2018; "Google's Dominance in Washington Faces a Reckoning," by John D. McKinnon and Brody Mullins, *Wall Street Journal*, October 30, 2017; "How 5 Tech Giants Have Become More Like Governments than Companies," National Public Radio, Inc., October 26, 2017; "Antitrust in a Time of Populism," by Carl Shapiro, Haas School of Business at the University of California at Berkeley, October 24, 2017; "The New Copycats: How Facebook Squashes Competition from Startups," by Betsy Morris and Deepa Seetharaman, *Wall Street Journal*, August 9, 2017;; "Amazon Bites Off Even More Monopoly Power," by Lina Khanjune, *New York Times*, June 21, 2017; "Is It Time to Break Up Google?" by Jonathan Taplin, New *York Times*, April 22, 2017; "WhatsApp's New Feature Continues Facebook's Snapchat Mimicry," by Mike Isaac,

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some calling for the breakup of Big Tech firms, are forcing the debate on Big Tech abuse of power in the areas of privacy and antitrust laws. The European model rejects the contemporary U.S. notion that price and efficiency are the only criteria necessary to judge monopolistic behavior and instead focuses on the impacts on market entry of new, innovative firms and on whether or not there is true competition in a market, as indicated by the presence of many competitors. The European model is a much broader view of antitrust issues and is similar to that of the earlier period of U.S. antitrust legislation, which looked at the structure of markets and competition, not just at consumer prices.

Case Study Questions

1. How does the first era of antitrust thinking (1890–1950s) differ from the second era?
2. What is a "natural monopoly," and how has the United States dealt with natural monopolies?
3. What are three possible solutions to the market dominance and anti-competitive behavior of Meta, Google, and Amazon?
4. How does the European model of antitrust issues differ from the U.S. model of antitrust issues?

8.8 REVIEW

KEY CONCEPTS

■ Understand why e-commerce raises ethical, social, and political issues.

- Internet technology and its use in e-commerce disrupts existing social and business relationships and understandings. Suddenly, individuals, business firms, and political institutions are confronted by new possibilities of behavior for which understandings, laws, and rules of acceptable behavior have not yet been developed. Many business firms and individuals are benefiting from the commercial development of the Internet, but this development also has costs for individuals, organizations, and societies. These costs and benefits must be carefully considered by those seeking to make ethical and socially responsible decisions, particularly where there are no clear-cut legal or cultural guidelines.
- The major issues raised by e-commerce can be loosely categorized into four major dimensions:
  - *Information rights*—What rights do individuals have to control their own personal information when Internet technologies make information collection so pervasive and efficient?
  - *Property rights*—How can traditional intellectual property rights be enforced when perfect copies of protected works can be made and easily distributed worldwide via the Internet?
  - *Governance*—Should the Internet and e-commerce be subject to public laws? If so, what law-making bodies have jurisdiction—state, federal, and/or international?
  - *Public safety and welfare*—What efforts should be undertaken to ensure equitable access to the Internet and e-commerce channels? Do certain online content and activities pose a threat to public safety and welfare?
- In Western culture, there are four basic principles that all ethical schools of thought share: responsibility, accountability, liability, and due process.

- Ethical, social, and political controversies usually present themselves as dilemmas. Ethical dilemmas can be analyzed via the following process:
  - Identify and clearly describe the facts.
  - Define the conflict or dilemma and identify the higher-order values involved.
  - Identify the stakeholders.
  - Identify the options that you can reasonably take.
  - Identify the potential consequences of your options.
  - Refer to well-established ethical principles, such as the Golden Rule, Universalism, the Slippery Slope, the Collective Utilitarian Principle, Risk Aversion, the No Free Lunch Rule, the *New York Times* Test, and the Social Contract Rule, to help you decide the best actions to take regarding the matter.

Understand basic concepts related to privacy and information rights, the practices of e-commerce companies that threaten privacy, and the different methods that can be used to protect online privacy.

- To understand the issues concerning online privacy, you must first understand some basic concepts:
  - *Privacy* is the moral right of individuals to be left alone, free from surveillance by or interference from others.
  - *Information privacy* includes the right to control personal information and to know what information is being collected, the right to due process, and the right to have personal information stored securely.
  - *Due process* as embodied by the FTC's Fair Information Practices principles, informed consent, and opt-in/opt-out policies also plays an important role in privacy.
- Concepts of privacy are different in the public sector versus the private sector. In the public sector, concepts of privacy have a long history that has evolved over two centuries of laws, regulations, and court rulings. In the private sector, privacy protection is less well defined and is continuing to evolve.
- Almost all online companies collect some personally identifiable information in addition to anonymous information and track the clickstream behavior of visitors.
- There are a number of different methods used to protect online privacy. They include:
  - Legal protections deriving from constitutions, common law, federal law, state laws, and government regulations. In the United States, rights to online privacy may be derived from the U.S. Constitution, tort law, federal laws such as the Children's Online Privacy Protection Act (COPPA), the FTC's Fair Information Practices principles, and a variety of state laws. In Europe, the European Commission's General Data Protection Regulation (GDPR) has standardized and broadened privacy protection in the European Union nations.
  - Industry self-regulation via industry alliances, which seek to gain voluntary adherence to industry privacy guidelines and safe harbors. Some firms also hire chief privacy officers.
  - Privacy-enhancing technological solutions include Apple's ITP and ATT, Google's Privacy Sandbox; differential privacy software, privacy default browsers, message encryption, spyware and ad blockers, secure e-mail, anonymous remailers, anonymous surfing, cookie blockers and managers, and public key encryption programs.

Understand the various forms of intellectual property and the challenges involved in protecting it.

- *Copyright law* protects original forms of expression such as writings, drawings, and computer programs from being copied by others for a certain period of time. It does not protect ideas—just their expression in a tangible medium. Copyrights, like all rights, are not absolute. The doctrine of fair use permits certain parties under certain circumstances to use copyrighted material without permission. The Digital Millennium Copyright Act (DMCA) was the first major effort to adjust U.S. copyright law to the Internet age. The DMCA implements a World Intellectual Property Organization treaty, which declares it illegal to make, distribute, or use devices that circumvent technology-based protections of copyrighted materials and enacts stiff fines and prison sentences for violations.

- *Patent law* grants the owner of a patent an exclusive monopoly to the ideas behind an invention for a certain period of time, typically 20 years. Patents are very different from copyrights in that patents protect the ideas themselves and not merely the expression of the ideas. There are four types of inventions for which patents are granted under patent law: machines, man-made products, compositions of matter, and processing methods. In order to be granted a patent, the applicant must show that the invention is new, original, novel, nonobvious, and not evident in prior arts and practices. Most of the inventions that make the Internet and e-commerce possible were not patented by their inventors. This changed in the mid-1990s with the commercial development of the Web.
- *Trademark protections* exist at both the federal and the state levels in the United States. Trademark law protects the public in the marketplace by ensuring that the public gets what it pays for and wants to receive and also protects the owner, who has spent time, money, and energy bringing the product to market against piracy and misappropriation. Federal trademarks are obtained, first, by use in interstate commerce, and second, by registration with the U.S. Patent and Trademark Office (USPTO). Trademarks are granted for a period of 10 years and can be renewed indefinitely. Use of a trademark that creates confusion with existing trademarks, causes consumers to make market mistakes, or misrepresents the origins of goods is an infringement. In addition, the intentional misuse of words and symbols in the marketplace to extort revenue from legitimate trademark owners ("bad faith") is proscribed. The Anticybersquatting Consumer Protection Act (ACPA) creates civil liabilities for anyone who attempts in bad faith to profit from an existing famous or distinctive trademark by registering an Internet domain name that is identical or confusingly similar to, or "dilutive" of, that trademark.
- *Trade secret laws* protect intellectual property that involves business procedures, processes, formulas, and methods of manufacture.

■ Understand how the Internet is governed, and identify major governance issues raised by the Internet and e-commerce.

- Governance involves social control: who will control e-commerce, what elements will be controlled, and how those controls will be implemented. We are currently in a mixed-mode policy environment in which self-regulation, via a variety of Internet policy and technical bodies, co-exists with limited government regulation.
- E-commerce raises the issue of how—and whether—to tax remote sales. The Internet Tax Freedom Act prohibits multiple or discriminatory taxes on electronic commerce and any taxation of Internet access. In 2018, the Supreme Court ruled that states could tax e-commerce sales even if the company making the sale did not have a physical connection to the state.
- Net neutrality refers to the idea that ISPs, including cable Internet, and wireless carriers, should treat all data on the Internet in the same manner and not discriminate or price differentially by content, protocol, platform, hardware, or application. Net neutrality remains an area of controversy.
- Many today are saying that big technology (Big Tech) firms such as Google, Amazon, Meta, and others have become too powerful and are restricting competition, giving rise to calls for further regulation.

■ Identify major public safety and welfare issues raised by e-commerce.

- Critical public safety and welfare issues in e-commerce include:
  - The protection of children and strong sentiments against pornography. Several attempts by Congress to legislate in this area have been struck down as unconstitutional. The Children's Internet Protection Act (CIPA), which requires schools and libraries in the United States to install "technology protection measures" (filtering software) in an effort to shield children from pornography, has, however, been upheld by the Supreme Court.
  - Efforts to restrict sales of cigarettes and drugs and to control gambling. In the United States, cigarettes, gambling, medical drugs, and addictive recreational drugs are either banned or tightly regulated by federal and state laws. Many offshore sites for these products and services have been shut down following government pressure. Online gambling is growing but is doing so more slowly than anticipated. Online fantasy sports betting is growing rapidly, and the Supreme Court has ruled that states can authorize and regulate online sports betting.

QUESTIONS

1. What basic assumption does the study of ethics make about individuals?
2. What are the basic principles of ethics?
3. What are the basic steps to follow in analyzing an ethical dilemma?
4. Define "universalism," "slippery slope," "the *New York Times* test," and "the social contract rule" as they apply to ethics.
5. Explain why people with a serious medical condition might be concerned about researching their condition online or about using a health-related mobile app. What are some technologies that could prevent one's personal information from being revealed?
6. How does the history of privacy in the public sector differ from that in the private sector?
7. Describe how the strength of a privacy policy can be measured.
8. How is the opt-in model of informed consent different from the opt-out model? In which type of model does the consumer retain more control?
9. What are the two core principles of the FTC's Fair Information Practices principles?
10. What is the GDPR?
11. List and describe five technological protections for online privacy.
12. What is a patent, and how does it differ from a copyright?
13. How could the Internet potentially change the protection given to intellectual property? What capabilities of the Internet make it more difficult to enforce intellectual property law?
14. What does the Digital Millennium Copyright Act (DMCA) attempt to do? Why was it enacted? What types of violations does it try to prevent?
15. Define cybersquatting. How is it different from cyberpiracy? What type of intellectual property violation does cybersquatting entail?
16. What is web scraping, and why is it a copyright issue?
17. What are some of the tactics that businesses that are illegal in the United States use on the Internet to operate outside the law?
18. Why can't pornographic sites simply be banned in the United States? Why has the Supreme Court struck down legislation intended to protect children from pornography?
19. What is the "right to be forgotten"? What are some of the risks and benefits of establishing this right?
20. What is the doctrine of "fair use"? Why did the courts decide that Google's scanning of copyrighted books was a "fair use"?

PROJECTS

1. Do a search on Google to find personal information about yourself. List the general types of information that you are able to find. Is there information that you were surprised to see or that you would like to be deleted? Review the various tools that Google provides that enable you to request the removal of certain information. Write a short report on what you discover.
2. Develop a list of privacy protection features that should be present if a website is serious about protecting privacy. Then visit at least four well-known websites, and examine their privacy policies. Write a report that rates each of the websites on the criteria you have developed.
3. Review the provisions of the Digital Millennium Copyright Act. Examine each of the major sections of the legislation, and make a list of the protections afforded intellectual property owners and users of copyrighted materials. Do you believe this legislation appropriately balances the interests of intellectual property owners and users? Do you have suggestions for strengthening "fair use" provisions in this legislation?
4. Review the section on net neutrality, and search for two articles that take a position on the topic. Summarize each article, and then write an essay describing your own position on net neutrality.

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PART 4

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E-commerce in Action

CHAPTER 9

Online Retail and Services

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

9.1 Explain how to analyze the economic viability of an online firm.
9.2 Understand the environment in which the online retail sector operates today.
9.3 Identify the primary types of online retailers and understand the different challenges each type faces.
9.4 Describe the major features of the offline and online service sectors.
9.5 Discuss the trends taking place in the online financial services industry today.
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NEW Video Cases

See **eText Chapter 9** to watch these videos and complete activities:

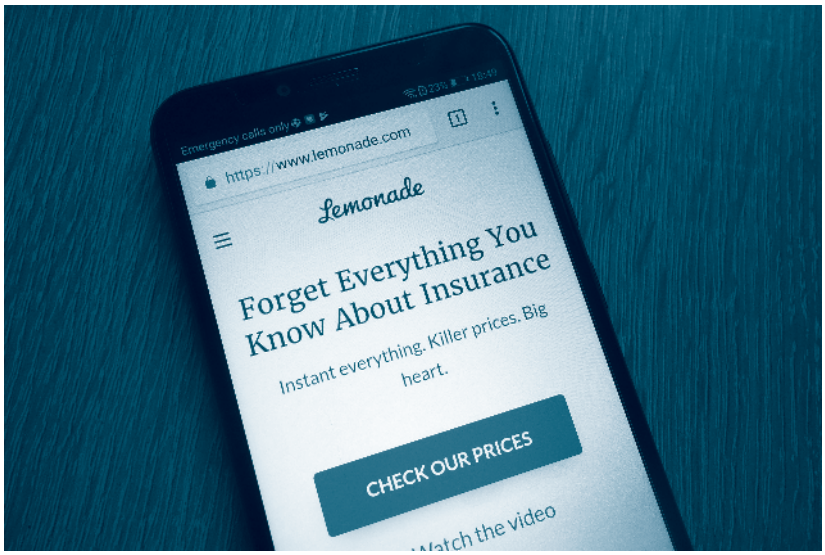
9.1 DoorDash Partners with BJ's Wholesale

9.2 SoFi and Fintech

Lemonade:

Stirring Up the Insurance Industry

Insurance is one of the largest industries in the world. Property, casualty, and life insurance premiums amount to approximately $5 trillion globally. In the United States, 14 of the *Fortune* 100 companies are insurance companies. Most of the leading insurance companies have been in business for well over a century.



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Insurance products can be very complex, and in the past, the insurance business has been driven by person-to-person interactions between consumers and insurance agents or brokers. In addition, the leading insurance companies have years of investment in legacy IT systems, as well as corporate cultures developed over many decades. The process of grafting new technologies and integrating new ways of doing business in such an environment is typically a slow one, leaving the industry ripe for a disruptive player

Enter Lemonade. Founded in 2015, Lemonade is a direct-to-consumer "insurtech" company. Lemonade is attempting to take the insurance industry by storm by leveraging a variety of cutting-edge technologies, such as big data collection and analysis, business intelligence analytics, artificial intelligence (AI), chatbots, and a sophisticated mobile app. Its digital platform spans marketing to customer care to claims processing, collecting and deploying data at each step along the way. Lemonade refers to itself as a digitally cloud-native and customer-centric insurance company.

Lemonade originally focused on the homeowners and renters insurance market but has since expanded into pet, term life, and car insurance on its way to becoming a one-stop shop for consumer insurance needs. In 2020 Lemonade went public, and in May 2022, it had a market valuation of more than $1.3 billion. Lemonade is also a Certified B Corp. Certified B Corps are companies certified by B Lab, an independent nonprofit organization, as meeting rigorous standards of social and environmental performance, accountability, and transparency.

The typical Lemonade customer is younger than 35. For more than 90% of these customers, Lemonade is their first experience obtaining insurance. Lemonade has pioneered a fundamentally different approach to the process than that of traditional insurers. For instance, the application process for a standard homeowners' policy is typically based on a form with between 20 and 50 fields (such as name, address, birth date). Lemonade, in

contrast, uses AI tools to dispense with forms altogether. To apply, a prospective customer uses a mobile app to interact with an AI chatbot named AI Maya. Maya uses a natural language interface and typically asks only about 13 questions before being able to give the customer a personalized quote for home insurance. Although Maya may ask only a limited number of questions, the interaction generates almost 1,700 data points, all of which are logged, aggregated, and mined for correlation to claims. Maya provides the interface for all types of insurance that Lemonade offers.

The claims process is handled by a different chatbot, AI Jim. Jim takes the first notice of loss from a customer making a claim in almost all cases and is typically able to handle the entire claim through resolution for about one-third of the cases. Sometimes Jim can authorize and pay a claim in as little as three seconds. Jim then assigns the rest of the process to human claims experts based on Jim's analysis of the expert's specialty, qualifications, workloads, and schedule.

Lemonade also has a chatbot platform, CX.AI, designed to understand and instantly resolve customer requests for assistance without human intervention. As of the end of 2021, about 30% of all customer inquiries were handled in this manner.

Lemonade's digital infrastructure is driven by three key proprietary applications: Forensic Graph, Blender, and Cooper. Forensic Graph uses big data, AI, and behavioral economics to predict, detect, and block fraud throughout the customer process. Blender is a built-from-scratch insurance management system that is designed to be a cohesive and streamlined management tool for Lemonade's customer experience and includes underwriting, claims, growth, marketing, finance, and risk teams. Cooper is an internal AI bot that handles complex as well as repetitive tasks, from helping Lemonade's customer experience teams handle manual processes such as processing paper checks to automatically running tens of thousands of tests on each release of its software. The latter is a particularly important task because Lemonade averaged more than 40 code releases per day in 2021. The frequent refreshing of its code means that Lemonade can promptly and efficiently modify customer onboarding questions, underwriting guidelines, claims handling, and other elements of its platform, enabling it to respond to changes in customer needs and market conditions at a faster rate than its traditional insurance competitors can.

But Lemonade's approach is not without controversy. In May 2021, a tweet from its Twitter account created outrage when it appeared to boast about how Lemonade's AI system boosted its profits by automatically denying claims based on analyzing videos submitted by customers. Lemonade quickly deleted the tweet and apologized, stating that Lemonade's AI does not use physical or personal features to deny claims and that its systems do not evaluate claims based on background, gender, appearance, skin tone, disability, or any other physical characteristic. However, in the same statement, Lemonade confirmed that it was using facial recognition technology to flag certain claims. Not long thereafter, Lemonade was sued in class action lawsuits in both Illinois and New York, alleging that it had violated biometric privacy laws in both states by collecting such data without users' knowledge and consent. In May 2022, Lemonade agreed to pay $4 million to settle certain of those suits.

Despite these missteps and even though, thus far, it has not shown a profit, Lemonade continues to grow. In July 2022, it finalized its acquisition of Metromile, a pioneer in

SOURCES: "3 Reasons Things Are Looking Up for Lemonade," by Rob Starks Jr., Fool.com, August 17, 2022; "Lemonade,

usage-based auto insurance that relies on telematic data received from sensors placed in connected cars or mobile apps to track mileage and driving behavior. Data includes speed, braking, and instances of distracted driving. According to Lemonade, access to this data, which Metromile had compiled over a 10-year period, was a major factor in its decision to acquire the company. Lemonade hopes to combine this data with Lemonade's sophisticated AI models to enable it to predict claims per mile driven. In addition, the Metromile acquisition will enable Lemonade to expand beyond the three states in which it previously secured licenses to sell auto insurance into a total of 49 states. Lemonade estimates that its current customers spend about $1 billion in auto insurance premiums per year, so the ability to cross-sell to those customers will provide Lemonade with a significant market opportunity.

Although Lemonade's stock price surged when it first went public in 2020, increasing from an initial share price of $70 to almost $165 a share by February 2021, since then it has declined, hitting a low of about $16 in mid-2022, buffeted by both economic conditions and investor disappointment in continuing losses. However, Lemonade sees brighter days ahead. It intends to continue to grow, as it believes insurance is an industry where scale matters. However, it also expects that its losses will narrow in the coming year, as returns on its earlier investments in homeowners and renters insurance begin to overtake the costs of new investments in areas like car insurance. As of the end of June 2022, it had almost 1.6 million customers, up from 1.2 million at the same time the previous year, and its revenue has continued to increase as well, reaching almost $95 million for the six-month period ending in June 2022. It also expects revenue to continue to grow at solid double-digit rates for quite some time. Its recent stock price reflects that optimistic view and has resumed an upward trajectory.

Inc. Shareholder Letter Q2," Lemonade.com, August 8, 2022; "You Have to Keep Growing If You Want to Be Successful in the Insurance Space, Says Lemonade CEO," Cnbc.com, August 1, 2022; "Could Lemonade's Auto Insurance Business Fuel Jump to the Next Level," by Matthew Frankel, Fool.com, July 28, 2022; "Lemonade on the Future of Insurance Technology," by Mark Hollmer, Insurancebusinessmag.com, July 28, 2022; "The Era of Uncertainty: Insurance," by Eleni Digalaki, Insider Intelligence/eMarketer, July 14, 2022; "Insurer Lemonade Reaches $4M Deal in Ill. Biometric Data Suit," by Josh Liberatore, Law360.com, May 18, 2022; "Lemonade Stock Looks Like a Bargain at Current Pricing," Schaeffersresearch.com, May 18, 2022; "Form 10-K for the Fiscal Year Ended December 31, 2021, Lemonade, Inc., Sec.gov, March 1, 2022; "AI Insurance Company Faces Class Action for Use of Biometric Data," by Carlton Fields and Michael Yaeger, Jdsupra.com, February 1, 2022; "Lemonade Insurance Faces Backlash for Claiming AI System Could Automatically Deny Claims," by Jonathan Greig, Zdnet.com, May 27, 2021.

The Lemonade case illustrates how a new online service provider is trying to disrupt a traditional financial services industry: insurance. The promise of online service providers such as Lemonade is that they can deliver superior-quality service and greater convenience to millions of consumers at a lower cost than traditional service providers can and still make a respectable return on invested capital. The service sector is one of the most natural avenues for e-commerce because so much of the value in services is based on collecting, storing, and exchanging information—something for which the Internet and the Web are ideally suited. The quality and amount of online information that can support consumer decisions in finance, travel, and career placement are extraordinary, especially when compared to what was available to consumers before e-commerce. The online service sector—like online retail—has established a significant beachhead and now plays a large role in consumer time spent on the Internet. In areas such as brokerage, banking, and travel, online services are an extraordinary success story and have transformed these industries.

Similarly, online retailers possess a number of advantages compared to traditional offline retailers, as well as some challenges. An online retailer can radically simplify the existing industry supply chain and develop an entirely new online distribution system that is far more efficient than traditional retail outlets. At the same time, an online retailer can create a better value proposition for the customer, improving customer service and satisfaction in the process. On the other hand, online companies often have razor-thin profit margins, lack a physical store network to bolster sales to the non-Internet audience, and are sometimes based on unproven business assumptions that, in the long term, may not pan out. In contrast, large traditional, offline retailers such as Walmart, Home Depot, Best Buy, Macy's, and Costco have established brand names, a huge real estate investment, a loyal customer base, and extraordinarily efficient inventory control and fulfillment systems. We will also see that, in order to leverage their assets and core competencies, established offline retailers have had to cultivate new competencies and a carefully developed business plan to succeed online.

This chapter begins with a section teaching you how to analyze the viability of an online firm, a topic that we will address throughout Part 4 of this book. Sections 9.2 and 9.3 examine the retail sector, both offline and online, and the major online retail business models in depth. Section 9.4 introduces the service sector. In Sections 9.5 through 9.7, we take a close look at three of the most significant types of online services: financial services (including insurance and real estate), travel services, and career services. In Section 9.8, we examine on-demand services companies, such as Uber, Airbnb, and a host of others, that have rocketed to prominence in the last several years. Using a business model that is both local and mobile, these companies provide a platform for consumers to connect with providers who can provide on-demand services, such as transportation, short-term room rental, grocery shopping, restaurant food delivery, and more.

Online retail and service providers faced a dramatic challenge in 2020–2021 from the Covid-19 pandemic, which severely impacted businesses around the world. Patterns of life and consumer behavior have undergone major changes in reaction to the pandemic, and it is impossible to predict which of those patterns will continue in the future. The next few years are likely to be a time of great risk, as well as great opportunity, as this period of extraordinary change unfolds.

9.1 ANALYZING THE VIABILITY OF ONLINE FIRMS

In this and the following chapters, we discuss the viability of a number of online companies that exemplify specific e-commerce models. We are primarily interested in understanding the near-to-medium term (1–3 years) economic viability of these firms and their business models. **Economic viability** refers to the ability of firms to survive as profitable business firms during a specified period. To investigate economic viability, we take two business analysis approaches: strategic analysis and financial analysis.

economic viability refers to the ability of firms to survive as profitable business firms during a specified period

STRATEGIC ANALYSIS

Strategic approaches to economic viability focus on both the industry in which a firm operates and the firm itself (see Chapter 2, Sections 2.2 and 2.5). The key industry strategic factors are:

- *Barriers to entry:* Can new entrants be barred from entering the industry through high capital costs or intellectual property barriers (such as patents and copyrights)?
- *Power of suppliers:* Can suppliers dictate high prices to the industry, or can vendors choose from among many suppliers? Have firms achieved sufficient scale to bargain effectively for lower prices from suppliers?
- *Power of customers:* Can customers choose from many competing suppliers and hence challenge high prices and high margins?
- *Existence of substitute products:* Can the functionality of the product or service be obtained from alternative channels or competing products in different industries? Are substitute products and services likely to emerge in the near future?
- *Industry value chain:* Is the chain of production and distribution in the industry changing in ways that benefit or harm the firm?
- *Nature of intra-industry competition:* Is the basis of competition within the industry based on differentiated products and services, price, scope of offerings, or focus of offerings? How is the nature of competition changing? Will these changes benefit the firm?

The strategic factors that pertain specifically to the firm and its related businesses include:

- *Firm value chain:* Has the firm adopted business processes and methods of operation that allow it to achieve the most efficient operations in its industry? Will changes in technology force the firm to realign its business processes?
- *Core competencies:* Does the firm have unique competencies and skills that cannot be easily duplicated by other firms? Will changes in technology invalidate the firm's competencies or strengthen them?
- *Synergies:* Does the firm have access to the competencies and assets of related firms owned either outright or through strategic partnerships and alliances?
- *Technology:* Has the firm developed proprietary technologies that allow it to scale with demand? Has the firm developed the operational technologies (e.g., customer relationship management, fulfillment, supply chain management, inventory control, and human resource systems) to survive?

- *Social and legal challenges:* Has the firm put in place policies to address consumer trust issues (privacy and security of personal information)? Is the firm the subject of lawsuits challenging its business model, such as intellectual property ownership issues? Will the firm be affected by changes in Internet taxation laws or other foreseeable statutory developments?

FINANCIAL ANALYSIS

Strategic analysis helps us comprehend the competitive situation of a firm. Financial analysis helps us understand how in fact the firm is performing. There are two parts to a financial analysis: the statement of operations and the balance sheet. The statement of operations tells us how much profit (or loss) the firm has generated, based on current sales and costs. The balance sheet tells us how many assets the firm has to support its current and future operations.

Here are some of the key factors to look for in a firm's statement of operations:

- *Revenues:* Are revenues growing and at what rate? Many e-commerce companies have experienced impressive, even explosive, revenue growth as an entirely new channel is created.
- *Cost of sales:* What is the cost of sales compared to the revenues from sales? Cost of sales typically includes the cost of the products sold and related costs. The lower the cost of sales compared to revenue, the higher the gross profit.
- *Gross margin:* What is the firm's gross margin, and is it increasing or decreasing? **Gross margin** is calculated by dividing gross profit by net sales revenues. Gross margin can tell you whether the firm is gaining or losing market power vis-à-vis its key suppliers.

gross margin
gross profit divided by net sales

- *Operating expenses:* What are the firm's operating expenses, and are they increasing or decreasing? Operating expenses typically include the costs of marketing, technology, and administrative overhead. They also include, in accordance with professional accounting standards (see as follows), stock-based compensation to employees and executives, amortization of goodwill and other intangibles, and impairment of investments. In e-commerce companies, these expenses can turn out to be very important. Many e-commerce firms compensate their employees with stock shares (or options), and many e-commerce firms purchase other e-commerce firms as a part of their growth strategy. Some of the companies are purchased at extremely high values using company stock rather than cash; in some instances, purchased companies fall dramatically in market value. All these items are counted as normal operating expenses.
- *Operating margin:* What did the firm earn from its current operations? **Operating margin** is calculated by dividing operating income or loss by net sales revenue. Operating margin is an indication of a company's ability to turn sales into pre-tax profit after operating expenses have been deducted. Operating margin also tells us whether the firm's current operations are covering its operating expenses, not including interest expenses and other non-operating expenses.

operating margin
calculated by dividing operating income or loss by net sales revenue

- *Net margin:* **Net margin** tells us the percentage of a firm's gross sales revenue that the firm was able to retain after all expenses were deducted. Net margin is calculated by dividing net income or loss by net sales revenue. Net margin sums up in one number

net margin
the percentage of a firm's gross sales revenue that the firm is able to retain after all expenses are deducted; calculated by dividing net income or loss by net sales revenue

how successful a company has been at the business of making a profit on each dollar of sales revenues. Net margin also tells us something about the efficiency of the firm by indicating the percentage of sales revenue that the firm is able to retain after all expenses are deducted from gross revenues, and, within a single industry, net margin can be used to measure the relative efficiency of competing firms. Net margin takes into account many non-operating expenses such as interest and stock compensation plans.

When examining the financial announcements of e-commerce companies, it is important to realize that online firms often choose not to announce their net income according to generally accepted accounting principles (GAAP). These principles have been promulgated by the Financial Accounting Standards Board (FASB), a board of professional accountants that establishes accounting rules for the profession and that has played a vital role since the 1934 Securities Act, which sought to improve financial accounting during the Great Depression. Many e-commerce firms report a calculation called *pro forma earnings* (also called EBITDA—earnings before income taxes, depreciation, and amortization). Pro forma earnings generally do not deduct stock-based compensation, depreciation, or amortization. The result is that pro forma earnings are always better than GAAP earnings. The firms that report earnings in this manner typically claim that these expenses are non-recurring, special, and "unusual." The SEC has guidelines (Regulation G) that prohibit firms from reporting pro forma earnings in official reports to the SEC but still allow firms to announce pro forma earnings in public statements (Weil, 2003). Throughout this book, we consider a firm's income or loss based on GAAP accounting standards only.

A **balance sheet** provides a financial snapshot of a company's assets and liabilities (debts) on a given date. **Assets** refer to stored value. **Current assets** are those assets such as cash, securities, accounts receivable, inventory, or other investments that are likely to be able to be converted to cash within one year. **Liabilities** are outstanding obligations of the firm. **Current liabilities** are debts of the firm that will be due within one year. Liabilities that are not due until the passage of a year or more are characterized as **long-term debt**. For a quick check of a firm's short-term financial health, examine its **working capital** (the firm's current assets minus its current liabilities). If working capital is only marginally positive, or negative, the firm will likely have trouble meeting its short-term obligations. Alternatively, if a firm has a large amount of current assets, it can sustain operational losses for a long period of time.

balance sheet
provides a financial snapshot of a company on a given date and shows its financial assets and liabilities

assets
refers to stored value

current assets
assets such as cash, securities, accounts receivable, inventory, or other investments that are likely to be able to be converted to cash within one year

liabilities
outstanding obligations of the firm

current liabilities
debts of the firm that will be due within one year

long-term debt
liabilities that are not due until the passage of a year or more

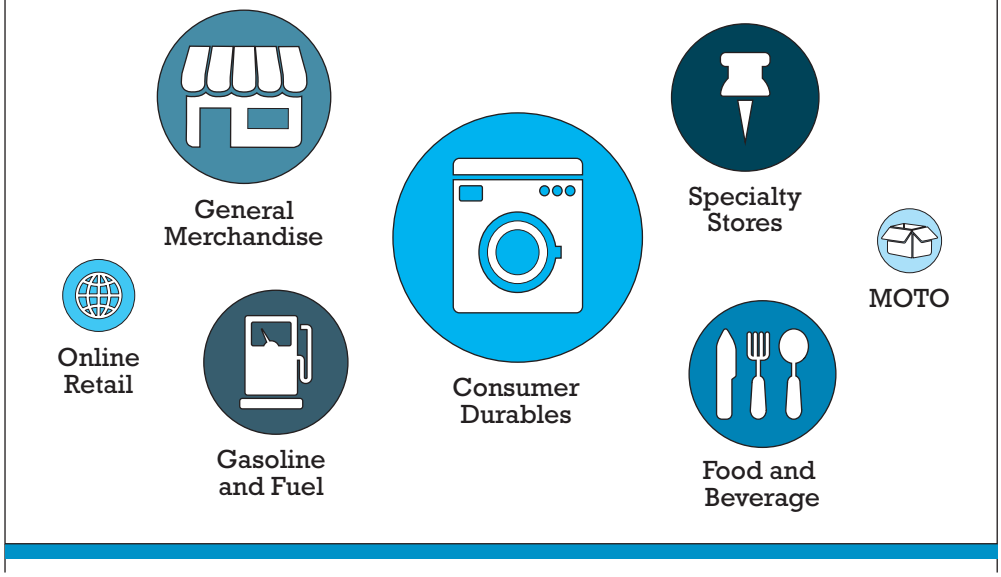
working capital
the firm's current assets minus its current liabilities

9.2 THE RETAIL SECTOR: OFFLINE AND ONLINE

By any measure, the size of the U.S. retail market is huge. For instance, in 2021, personal consumption of retail goods accounted for about $5.5 trillion (about 24%) of the total gross domestic product (GDP) (Bureau of Economic Analysis, U.S. Department of Commerce, 2022).

The retail industry is composed of many different types of firms. **Figure 9.1** illustrates the major segments: durable goods, general merchandise, food and beverage, specialty stores, gasoline and fuel, mail order/telephone order (MOTO), and online retail firms.

FIGURE 9.1 COMPOSITION OF THE U.S. RETAIL INDUSTRY



The retail industry can be grouped into seven major segments.
SOURCE: Based on data from U.S. Census Bureau, 2012.

Each of these segments offers opportunities for online retail, and yet in each segment, the uses of the Internet may differ. Some eating and drinking establishments use the Web and mobile apps to inform people of their physical locations and menus, while others offer delivery via online orders. Retailers of durable goods originally used the online channel primarily as an informational tool rather than as a direct purchasing tool, but this has begun to change.

ONLINE RETAILING

Online retail is perhaps the most high-profile e-commerce sector. Many of the early online-only firms that pioneered the online retail marketspace failed. Entrepreneurs and their investors seriously misjudged the factors needed to succeed in this market. But the survivors of this early period emerged much stronger, and along with traditional offline general and specialty merchants (who are now participating as omnichannel merchants), as well as new startups, the online retail space is growing and is increasing its reach and size.

Table 9.1 summarizes some of the leading trends in online retailing for 2022–2023. Perhaps the most important trend in online retailing is the effort by retailers—both offline and online—to integrate their operations so that they can serve customers in the various ways customers want to be served. We will examine the trends listed in this table further throughout the following sections.

Online Retailing: The Vision

In the early years of e-commerce, entrepreneurial web-based retailers were drawn to the marketplace for retail goods simply because it was one of the largest market opportunities in the U.S. economy. Some predicted that the retail industry would be revolutionized, literally "blown to bits"—as prophesied by two consultants in a famous Harvard

TABLE 9.1 WHAT'S NEW IN ONLINE RETAIL 2022–2023

BUSINESS
• The Covid-19 pandemic created a more than 35% increase in e-commerce retail purchasing in 2020, and since then, retail e-commerce has continued to grow and is expected in 2022 to top $1 trillion for the first time. Online retail remains the fastest-growing retail channel. • The number of online shoppers (about 240 million, 85% of the U.S. population) and buyers (about 215 million, more than 75% of the U.S. population), as well as the average annual dollar amount purchased (about $4,890), continues to increase. • Retail m-commerce continues to accelerate, increasing from around $250 billion in 2019 to more than $415 billion in 2022, driven in part by a change in purchasing habits due to the Covid-19 pandemic. • Social e-commerce starts to gain serious traction, as Facebook, Pinterest, Instagram, and TikTok, together with online retailers, work to facilitate online purchasing on social networks. • Local e-commerce continues to grow, in part due to the increase in the "buy online/pick up in store" (BOPIS) functionality that is increasingly being offered by omnichannel retailers, as well as Amazon's Local Selling initiative, which enables BOPIS for third-party sellers on Amazon's marketplace platform. • Online platforms such as Shopify, eBay, and Etsy enable online retail operations by small- and medium-sized businesses. • Thousands of virtual merchants, seeking to emulate the success of pioneers such as Birchbox, Naturebox, and Barkbox, employ a subscription-based revenue model for retail, generating more than $30 billion in 2022. Beauty products and meal kits are among the most popular products. Omnichannel merchants such as Walmart and Macy's also offer subscription-based boxes.
TECHNOLOGY
• Online retailers place an increased emphasis on providing an improved "shopping experience," including ease of navigation and use, online inventory updates, interactive tools, customer feedback and ratings, and social e-commerce. Friction-free/frictionless commerce that leverages technology to enhance consumer convenience becomes a priority. • Mobile retail apps become a must-have for major retailers. • Online retailers increase the use of interactive marketing technologies and techniques such as influencer marketing, user-generated content, videos that exploit the dominance of broadband connections and offer features such as the ability to zoom in on a product, color switch, product configuration, and virtual simulations of households and businesses. Online retailers are also beginning to investigate how they can use metaverse technologies. • Big data, coupled with artificial intelligence and powerful analytic programs, is giving online retailers the abilities to create personalized products and to engage in personalized marketing.
SOCIETY
• Economic conditions in 2022, including rising inflation, pose challenges and threaten to slow e-commerce growth. • Consumer interest in sustainability encourages the growth of resale e-commerce, particularly in the fashion industry.

Business School book (Evans and Wurster, 2000). The basis of this revolution would be fourfold. First, because the Internet greatly reduced both search costs and transaction costs, consumers would use the Web to find the lowest-cost products. Several results would follow. Consumers would increasingly drift to the Web for shopping and purchasing, and only low-cost, high-service, quality online retail merchants would survive.

Economists assumed that the online consumer was rational and cost-driven—rather than driven by perceived value or brand, both of which are nonrational factors.

Second, it was assumed that the entry costs to the online retail market were much less than those needed to establish physical storefronts and that online merchants were inherently more efficient at marketing and order fulfillment than offline stores. The costs of establishing a powerful website were thought to be minuscule compared to the costs of establishing warehouses, fulfillment centers, and physical stores. There would be no difficulty building sophisticated order-entry, shopping cart, and fulfillment systems because this technology was well known and because the cost of technology was falling by 50% each year. Even the cost of acquiring consumers was thought to be much lower because of search engines that could almost instantly connect customers to online vendors.

Third, as prices fell, traditional offline physical store merchants would be forced out of business. New entrepreneurial companies—such as Amazon—would replace the traditional stores. It was thought that if online merchants grew very quickly, they would have first-mover advantages and would lock out the older, traditional firms that were too slow to enter the online market.

Fourth, in some industries—such as electronics, apparel, and digital content—the market would be disintermediated as manufacturers or their distributors entered to create a direct relationship with the consumer, thus destroying the retail intermediaries or middlemen. In this scenario, traditional retail channels—such as physical stores, sales clerks, and sales forces—would be replaced by a single dominant channel: the Web.

Many predicted, on the other hand, a kind of hypermediation based on the concept of a virtual firm in which online retailers would gain advantage over established, offline merchants by building an online brand name that attracted millions of customers and outsourcing the expensive warehousing and order fulfillment functions—the original concept of Amazon.

As it turned out, few of these assumptions and visions were correct, and the structure of the retail marketplace in the United States, with some notable exceptions, has not been blown to bits, disintermediated, or revolutionized in the traditional meaning of the word "revolution." In 2022, after more than 25 years of e-commerce expansion, retail e-commerce is still expected to account for just 15% of total retail sales in the United States.

With several notable exceptions, online retail has often not been successful as an independent platform on which to build a successful online-only business. Many of the first-mover, online-only merchants failed to achieve profitability and closed their doors en masse as their venture capital funds were depleted. There are a number of reasons for the difficulties experienced by many online retailers in achieving profits. The path to success in any form of retail involves having a central location in order to attract a large number of shoppers, charging high enough prices to cover the costs of goods as well as marketing, and developing highly efficient inventory and fulfillment systems so that the company can offer goods at lower costs than competitors and still make a profit. Many of the early online merchants failed to follow these fundamental ideas, lowering prices below the total costs of goods and operations, failing to develop efficient business processes, failing to attract a large enough audience to their websites, and spending far too much on customer acquisition and marketing. Today, the lessons of the past have

been learned, and far fewer online merchants are selling below cost, especially if they are startup companies. There's also been a change in consumer culture and attitudes. Whereas in the past consumers looked online for inexpensive prices, today they look to online purchasing for convenience, time savings, and time shifting (buying retail goods at night from the sofa). Consumers have been willing to accept higher prices in return for the convenience of shopping online and avoiding the inconvenience of shopping at stores and malls. This allows online merchants more pricing freedom. As it turns out, the consumer is not primarily price-driven when shopping on the Internet but instead considers brand name, trust, reliability, delivery time, convenience, ease of use, and above all "the experience" to be at least as important as price (Brynjolfsson, Dick, and Smith, 2004).

On the other hand, as predicted, online retail has indeed become the fastest-growing and most dynamic retail channel in the sense of channel innovation. The Web has created a new marketplace for millions of consumers to conveniently shop. The Internet and the Web have continued to provide new opportunities for entirely new firms using new business models and new online products. The Internet has also created an entirely new venue for **omnichannel** firms (those that sell products through a variety of channels and integrate their physical stores with their websites and mobile platform). Traditional retailers have been the fast followers (although many of them cannot be characterized as particularly "fast") and are succeeding online by extending their traditional brands, competencies, and assets. In this sense, e-commerce technological innovation is following the historical pattern of other technology-driven commercial changes, from automobiles to radio and television, where an explosion of startup firms attracts significant investment but the firms quickly fail and are consolidated into larger existing firms.

omnichannel
retailers that sell products through a variety of channels and integrate their physical stores with their website and mobile platform

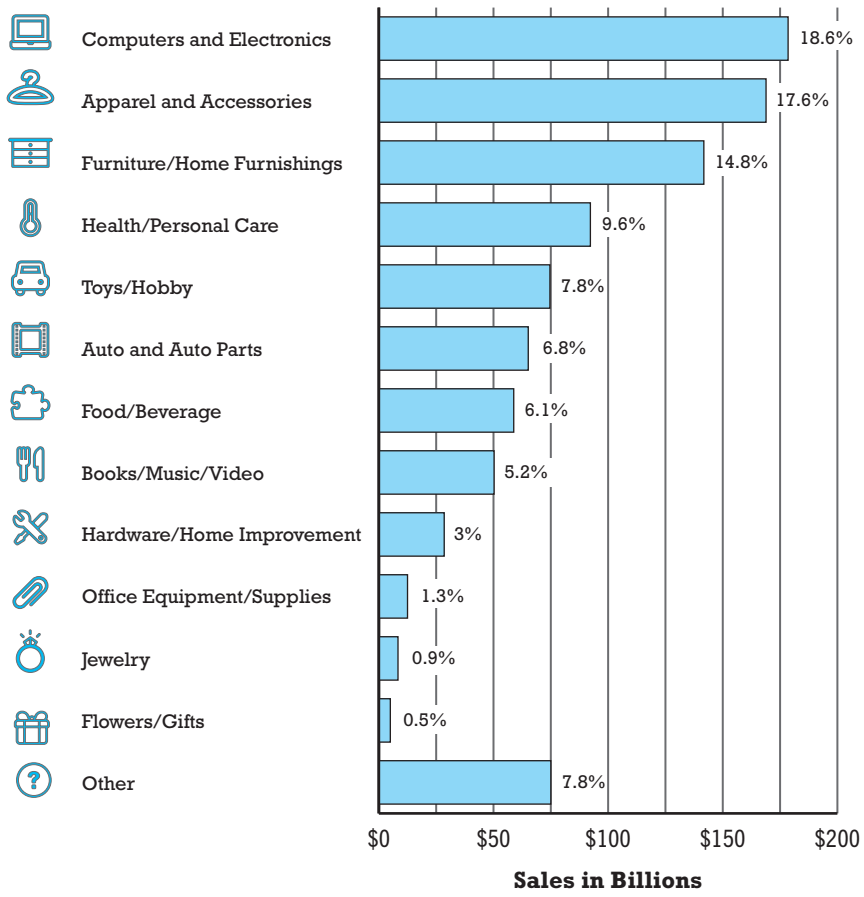
The Online Retail Sector Today

Although online retailing is one of the smallest segments of the retail industry, constituting only about 15% of the total retail market in 2022, it is growing at a faster rate than its offline counterparts. Through the years, the selection of goods for purchase online has grown, expanding from items such as books, office supplies, and toys to more expensive items such as consumer electronics, furniture, and luxury products.

Figure 9.2 illustrates the leading e-commerce categories in terms of revenue generated. In 2021, the computers and consumer electronics category generated the highest amount of revenue, around $179 billion. Online shopping options for this category include Amazon (which accounts for almost 50% of all revenues in this category); direct manufacturers such as Apple, Dell, HP, and Lenovo; omnichannel chains such as Best Buy; and companies that were formerly catalog merchants, such as CDW and PC Connection.

The apparel and accessories category generated the second-highest percentage of revenue, around $169 billion in 2021. Consumers have a wide choice of online shopping options in this category, such as omnichannel department store chains like Macy's, Target, and Walmart and specialty retailers like Gap, J.Crew, American Eagle, Urban Outfitters, Abercrombie & Fitch, and Ralph Lauren. This is one category where Amazon does not dominate, in part because shoppers tend to identify more strongly with a specific brand of clothing than they do with products that are more of a commodity, such as consumer electronics. Even so, Amazon accounts for more than 30% of the sales in this category.

FIGURE 9.2 ONLINE RETAIL REVENUES BY CATEGORY, 2021



Computers and consumer electronics was the leading online purchase category in 2021, accounting for almost 19% of all online retail revenues.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022a, 2022b; authors' estimates.

The furniture and home furnishing category was in third place, generating about $142 billion in 2021. In the past, the expense of shipping large items such as furniture, mattresses, and rugs was a deterrent to online sales, but that is beginning to change. In addition to Amazon, leading online retailers in this category include other online-only companies such as Wayfair and Overstock as well as omnichannel retailers such as Ikea, Williams-Sonoma, Bed Bath & Beyond, and Crate and Barrel.

The health and personal care (drugs, health, and beauty supplies) category has also enjoyed steady growth, with about $92 billion in revenue in 2021, and is expected to be the fastest-growing category between 2022 and 2026.

The automobile and automobile parts and accessories category generated around $65 billion in 2021. Prior to the Covid-19 pandemic, consumers interested in purchasing

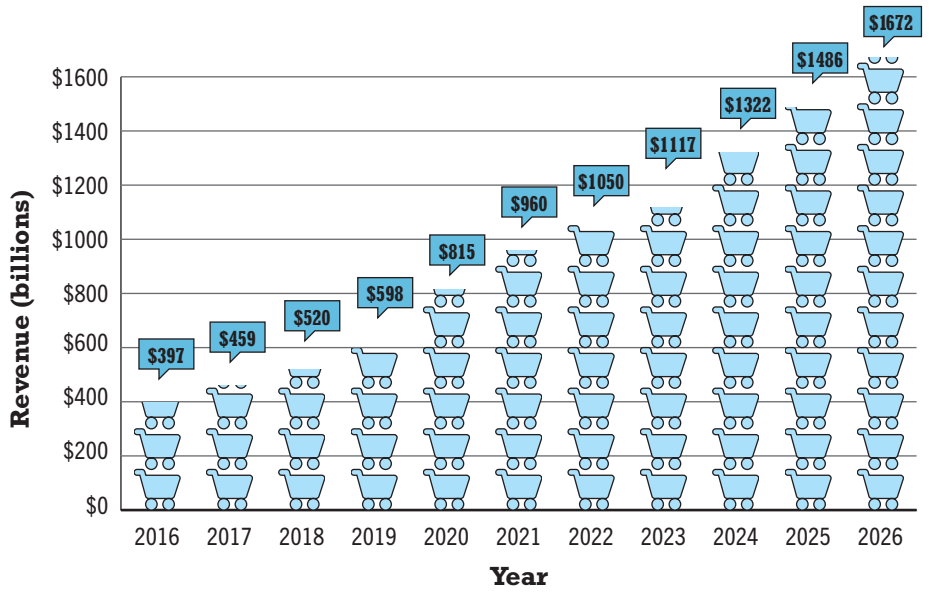
a car primarily used the Web to conduct product and pricing research, which they then used to negotiate with dealers, and most e-commerce revenues were generated by the sale of car accessories and car parts. However, the pandemic increased demand for automobiles, particularly used cars. Digitally native direct-to-consumer companies such as Carvana and Vroom have leveraged this demand to disrupt the used car market. For example, Carvana's U.S. e-commerce sales more than doubled in 2021, to almost $13 billion, and are expected to grow to almost $20 billion in 2022, pushing it into the top-10 e-commerce companies in terms of U.S. e-commerce sales.

Books, music, and video are among the original items sold successfully online. This still-popular online category generated about $50 billion in 2021. Leading retailers in this category include Amazon, Apple, Google Play, and Barnes & Noble.

The Covid-19 pandemic created a more than 35% increase in retail revenues in 2020, in part due to a shift by consumers to purchasing essential goods online **(Figure 9.3)**. When we refer to online retail, we are not including revenues from online services such as travel or the purchase of online content. Instead, for the purposes of this chapter, "online retail" refers solely to sales of physical goods over the Internet. The Internet provides a number of unique advantages and challenges to online retailers. **Table 9.2** summarizes these advantages and challenges.

Despite the high failure rate of online retailers in the early years, more consumers than ever are shopping online. For most consumers, the advantages of online shopping overcome the disadvantages. In 2022, it is estimated that 83.5% of Internet users older

FIGURE 9.3 THE GROWTH OF ONLINE RETAIL IN THE UNITED STATES



Online retail revenues are expected to increase to more than $1.67 trillion by 2026, almost tripling since 2019.
SOURCE: Based on data from Insider Intelligence/eMarketer, 2022c.

TABLE 9.2 ONLINE RETAIL: ADVANTAGES AND CHALLENGES

ADVANTAGES	CHALLENGES
Lower supply chain costs by aggregating demand at a single company and increasing purchasing power	Consumer concerns about the security of transactions
Lower cost of distribution using websites rather than physical stores	Consumer concerns about the privacy of personal information
Ability to reach and serve a much larger, geographically distributed group of customers	Delays in delivery of goods when compared to shopping at a physical store
Ability to react quickly to customer tastes and demand	Inconvenience associated with returning damaged goods or exchanging goods
Ability to change prices nearly instantly	Overcoming lack of consumer trust in online brand names
Ability to rapidly change visual presentation of goods	Added expenses for online photography, video, and animated presentations
Avoidance of direct marketing costs of catalogs and physical mail	Online marketing costs
Increased opportunities for personalization and customization	Added complexity to product offerings and customer service
Ability to greatly improve information and knowledge delivered to consumer	Greater customer information can translate into price competition and lower profits
Ability to lower consumers' overall market transaction costs	Ability to achieve consistent revenue growth and profit

than the age of 14 (around 215 million people) will make a purchase online, generating more than $1 trillion in online retail sales. While the number of new Internet users in the United States is not growing as rapidly as it was, with almost 90% of the U.S. population already on the Internet, this slowdown will not necessarily reduce the growth in online retail e-commerce because the average shopper is spending more on the Internet each year and finding many new categories of items to buy. For instance, in 2003, the average annual amount spent online by users was $675, but by 2022, it had jumped to an estimated $4,890 (Insider Intelligence/eMarketer, 2022c; eMarketer, Inc., 2005). Also, as noted in Chapter 6, millions of additional consumers research products online and are influenced in their purchase decisions at offline stores.

The primary beneficiaries of this growing consumer support are not just online-only companies but also the established offline retailers who have the brand-name recognition, supportive infrastructure, and financial resources to compete in the online marketplace successfully. Apart from Amazon (the leader by far), eBay, Wayfair, and a few other online-only firms, the top online retail firms in terms of online sales are primarily omnichannel firms, such as Walmart and Target, that have established brand names and for whom e-commerce still plays a relatively small role when compared to their offline physical store channels. For instance, the 202 omnichannel retail chains ranked in the 2022 Digital Commerce 360 Top 1000 increased their online sales by more than 55% in 2020 and by another 11.5% in 2021 (Young, 2022).

For traditional firms, the challenge is to integrate their web and mobile operations with their physical store operations in order to provide an "integrated shopping customer experience" so that customers can move seamlessly from one environment to another. Customers want to shop wherever they want, using any device, and at any time. Established retailers have significant fulfillment, inventory management, supply chain management, and other competencies that apply directly to the online channel. To succeed online, established retailers need to extend their brands, provide incentives to consumers to use the online channel (which, given the same prices for goods, is more efficient to operate than a physical store), avoid channel conflict, and build advertising campaigns using online search engines and shopping comparison sites.

Although the early results of many large physical store retailers that attempted to develop online channels were not particularly promising, with many struggling and some having to declare bankruptcy or shut down, today some clear omnichannel leaders have emerged, most specifically, Walmart, Target, Home Depot, Best Buy, Costco, Macy's, and Lowe's, all of which are among the top 15 in terms of retail e-commerce sales.

Table 9.3 illustrates some of the various ways in which these successful traditional retailers have integrated the Web, the mobile platform, and physical store operations

TABLE 9.3 RETAIL E-COMMERCE: OMNICHANNEL INTEGRATION METHODS

INTEGRATION TYPE	DESCRIPTION
Online catalog	Online catalog supplements offline physical catalog, and often the online catalog has substantially more product on display.
Online order, in-store pickup (BOPIS/click-and-collect)	One of the first and now one of the most common types of integration.
Online order, in-store returns, and adjustments	Defective or rejected products ordered online can be returned to any store location. Most major omnichannel firms now offer this option.
Online order, store directory, and inventory	When items are out of stock online, customer is directed to physical store network inventory and store location.
In-store kiosk online order, home delivery	When retail store is out of stock, customer orders in store and receives at home.
In-store retail clerk online order, home delivery	Similar to in-store kiosk online order, except that as a normal part of the in-store checkout process, the retail clerk searches online inventory if local store is out of stock.
Manufacturers use online promotions to drive customers to their distributors' retail stores.	Consumer product manufacturers such as Colgate-Palmolive and Procter & Gamble use online channels to design new products and promote existing-product retail sales.
Gift card, loyalty program points can be used in any channel.	Recipient of gift card, loyalty program points can use them to purchase in store, online, or via catalog, if offered by merchant.
Mobile order, website, and physical store sales	Apps take users directly to specially formatted website for ordering, or to in-store bargains.
Geo-fencing mobile notification, in-store sales	Use of smartphone geo-location technology to display targeted ads for nearby stores and restaurants.

to develop nearly seamless omnichannel shopping. This list is not exclusive, and retailers continue to develop new links among channels, especially the mobile channel. Friction-free/frictionless commerce that leverages technology to enhance consumer convenience has become a priority.

At the same time, online-only retailers like Amazon have sought to build a physical store presence, and they are finding that this effort is difficult and will take many years to implement. Amazon purchased the Whole Foods chain of stores in 2017 as a way to quickly acquire physical presence in the retail food sector. Prior to the Covid-19 pandemic, other acquisitions of existing retail stores by online retailers seemed likely, although many of those plans were put on hold due to the pandemic and subsequent economic conditions.

Rather than demonstrate disintermediation, online retailing provides an example of the powerful role that intermediaries continue to play in retail trade. Established offline retailers have rapidly gained online market share. Increasingly, consumers are attracted to stable, well-known, trusted retail brands and retailers. The online audience is very sensitive to brand names and is not primarily cost-driven. Other factors such as reliability, trust, fulfillment, and customer service are equally important.

The continuing extraordinary growth in m-commerce, social e-commerce, and local e-commerce is another important aspect of online retail today. The mobile platform has fully emerged as a retail marketing and shopping tool. In 2022, U.S. retail m-commerce is expected to generate about $415 billion overall, and more than 85% of online buyers are expected to make a purchase using a mobile device, driven in part by changes in purchasing habits due to the Covid-19 pandemic. Mobile retail apps have become a must-have for major retailers.

Local merchants are a major benefactor of the growing m-commerce platform. Local e-commerce has been further enhanced by the increase in the "buy online/pick up in store" (BOPIS) option that is a feature now offered by many omnichannel retailers as well as Amazon's Local Selling initiative.

Social networks have also become a central factor of everyday life, with people spending an increasing amount of time on one or more social networks, sharing their experiences and commenting on many topics, including businesses, products, and services. Social networks are not just an important platform for online advertising and marketing but, increasingly, also for the conduct of e-commerce—by clicking through to a website or opening an app where the purchase occurs or directly via the social network. In 2022, more than 100 million people in the United States are "social" buyers who have made at least one purchase via a social network, and social e-commerce sales are expected to top $53 billion, a more than 33% increase from 2021. Facebook is the most commonly used platform by social buyers, followed by Instagram, TikTok, and Pinterest (Insider Intelligence/eMarketer, 2022d, 2022e, 2022f).

Another important trend in online retail today is the increasing use by retailers, large and small, of big data and artificial intelligence (AI). The *Insight on Technology* case, *Stitch Fix Builds a Business on Big Data and Artificial Intelligence*, examines this development.

INSIGHT ON TECHNOLOGY

STITCH FIX BUILDS A BUSINESS ON BIG DATA AND ARTIFICIAL INTELLIGENCE

Big data refers to the deluge of digital data that is being produced by the billions of people using the Internet around the world, as well as an explosion of data from the Internet of Things. But big data is about more than volume: It is also about velocity (data comes in real-time torrents, loses value quickly, and requires rapid responses); variety (the data deluge contains both structured numeric data and unstructured data such as e-mail, video, and audio); variability (the flow of data is event-driven and leads to peak loads followed by relative calm); and complexity (the data comes from different sources and requires cleansing, matching, and reformatting in order to be useful). Storing all this data requires new kinds of database technologies, and analyzing it involves software called business analytics.

Big data can lead to better decisions and competitive advantages for firms that get it right and is influencing the design and marketing of retail products and in-store sales efforts. Big data, coupled with artificial intelligence (AI) and powerful analytics programs, has given companies the ability to create personalized products and engage in personalized marketing that is able to recommend products before a customer even asks for them. Predictive marketing is different from traditional, in-person sales because it is based on the collection of data and the use of AI machine learning algorithms to maximize the likelihood of a sale. Predictive marketing can scale to millions of customers and make decisions in milliseconds.

Stitch Fix, an online clothing retailer that began by using a monthly subscription revenue model, is one example of an online retailer using big data, AI, and predictive marketing. Stitch Fix blends expert styling advice, personalization software, and unique products to deliver an individualized shopping experience. New subscribers fill out an online Style Profile that includes basic demographic information, which is then analyzed by the firm's proprietary software to identify products that the customer is likely to purchase. Data is also gleaned from Style Shuffle, which displays different items that the client rates with a thumbs up or a thumbs down. As of August 2022, Stitch Fix has captured 10 billion interactions with Style Shuffle, which it processes to create an interactive visualization that it uses to identify the style preferences of its clients and filter its inventory. Personal stylists interpret the output of the system and then handpick five clothing items and accessories each month that are unique to the customer's taste, budget, and lifestyle. The customer is not required to purchase the items until they have been received and accepted; in addition, the process to return the items is simple.

Over time, the software keeps track of what the customer purchased and learns to make even better predictions based on what customers actually keep (as opposed to what they say they want, a key difference). The more accurately Stitch Fix can predict what its customers will likely buy, the more sales it will generate, but using analytics to better understand its customers also allows Stitch Fix to reduce its inventory costs, to adjust production to better meet demand, to know its customers better than its competitors do, and even to fill and ship its orders in the most efficient way.

Stitch Fix uses its customer data to make continual improvements to its hundreds of

(continued)

(continued)

machine learning algorithms, which become more accurate as they are exposed to more customer data. If tweaks to the algorithm are shown to be more predictive, those tweaks become permanent, whereas changes that fail to improve the algorithm are discarded. Stitch Fix's algorithms synthesize customer feedback, purchase and return decisions, and profile information to quickly generate possible recommendations. Stitch Fix stylists then use these results to make their next selections. The combination of algorithmic and human decision-making creates a level of personalization that provides customers with the best of both worlds. The company has a team of data scientists developing new tools and improving its algorithms. For instance, in 2022, Stitch Fix experimented with DALL-E2, a powerful AI text-to-image system that allows Stitch Fix to visualize products based on specific characteristics such as color, fabric, and style, which can help stylists find the perfect match for the item within Stitch Fix's inventory. Using new advances in natural language processing, Stitch Fix is also working on ways to enable its machine language algorithms to better extract meaning from freeform text feedback, which has always been a challenge for machine learning models.

The Covid-19 pandemic and its aftermath have presented both a challenge and an opportunity for Stitch Fix. In September 2021, Stitch Fix introduced a new platform called Freestyle, which was built on earlier efforts to enable customers who were not subscribers to have a personalized shopping experience. In an interesting take on the axiom "Everything new is old again," Freestyle is designed to digitally recreate the discovery process that takes place in a traditional department store, where brands and styles are showcased together. In Freestyle, a customer first creates a style profile. Using that data, plus data from customers who are demographically similar, Stitch Fix then creates a personal shop in which the customer is presented with a personalized feed of 24 looks. No two customers get the same feed. Styles refresh throughout the day, based on inventory availability. Stitch Fix believes Freestyle addresses one of the inconveniences of online shopping: that customers are forced to search and scroll for products, with the vast majority of what is being displayed not being relevant to the customer.

Although Stitch Fix reached an annual net revenue of $2 billion in 2021, it has hit some headwinds in 2022, with consumers reacting to economic conditions by slowing their purchasing. Many subscription services have experienced a decline in the number of subscribers, as consumers look to pare down their expenses, and Stitch Fix has not been an exception, with the number of active subscribers declining by 200,000 from May 2021 to April 2022. New CEO Elizabeth Spaulding is looking to Freestyle as the wave of the future. Regardless of Stitch Fix's level of success going forward, big data, machine learning, and the predictive marketing algorithms that power its business model are likely to become the new normal in online retail.

SOURCES: "Businesses Including Stitch Fix Already Experimenting with DALL-E2," by Kyle Wiggers, Techcrunch.com, August 9, 2022; "10 Billion Interactions (and Counting!) on Style Shuffle: The Data Powering Your Personalized Shopping Experience," Newsroom.stitchfix.com, August 3, 2022, "Your Opinion Matters," by Reza Sohrabi, Agnieszka Szefer, and Alex Whedon, Multithreaded.stitchfix.com, July 19, 2022; "How Stitch Fix CEO Elizabeth Spaulding Plans to Turn around the Personal Styling Company," by Emma Hinchliffe and Paige McGlauflin," Fortune.com, July 6, 2022; "Stitch Fix Lays out 'Blueprint for Future of Retail,'" by Siblie Marcellus, News.yahoo.com, October 27, 2021; "Stitch Fix Expands Service with Launch of Stitch Fix Freestyle," Prnewswire.com, September 21, 2021; "Stitch Fix Wants to Revolutionize E-commerce—By Treating It Like an Old-School Department Store," by Elizabeth Segran, Fastcompany.com, September 15, 2021; "The Stitch Fix Story: How the Unique Prioritization of Data Science Helped the Company Create Billions in Market Value," by Steven Li, Forbes.com, February 17, 2020; "Personalization Is at Stitch Fix's Core," Digitalcommerce360.com, November 4, 2019; "Stitch Fix: The Amazing Use Case of Using Artificial Intelligence in Fashion Retail," by Bernard Marr, Forbes.com, May 25, 2018; "How Stitch Fix Uses Machine Learning to Master the Science of Styling," by Natalie Gagliordi, Zdnet.com, May 23, 2018.

9.3 E-COMMERCE IN ACTION: ONLINE RETAIL BUSINESS MODELS

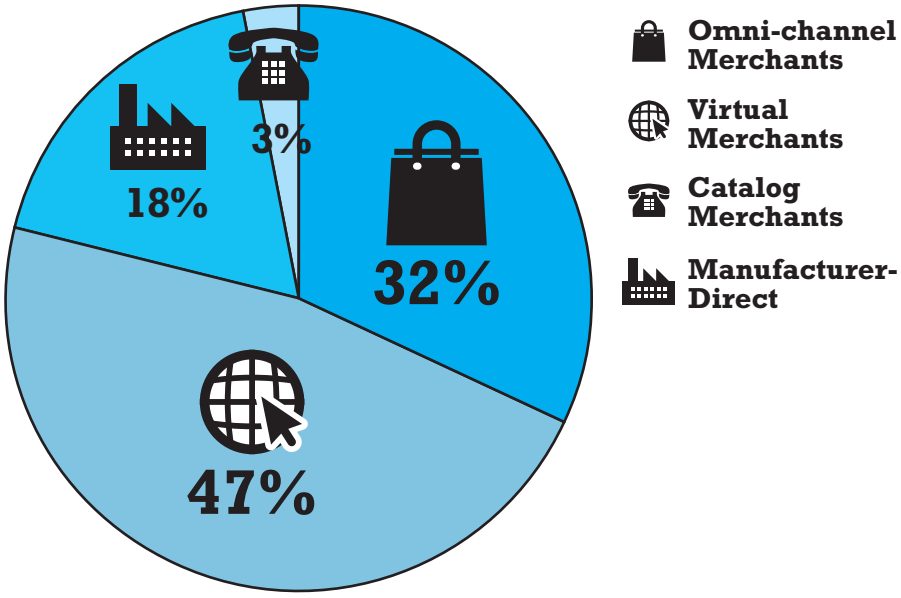
So far, we have been discussing online retail as if it were a single entity. In fact, as we briefly discussed in Chapter 2, there are actually four main types of online retail business models: virtual merchants, omnichannel merchandisers (sometimes referred to as bricks-and-clicks or clicks-and-bricks), manufacturer-direct firms and catalog merchants. **Figure 9.4** illustrates the respective shares of 2021 online retail sales for each of these categories of firms. View the Figure 9.4 video in the eText for an animated and more detailed discussion of this figure. In addition, there are thousands of small retailers that use eBay, Etsy, Amazon and other third-party sales platforms. Each of these different types of online retailers faces a different strategic environment as well as different industry and firm economics.

VIRTUAL MERCHANTS

Virtual merchants are e-commerce firms that generate almost all their revenue from online sales. Virtual merchants face extraordinary strategic challenges. They must build a business and brand name from scratch, quickly, and in an entirely new channel and must confront other virtual merchant competitors (especially in smaller, niche areas). Because these firms typically do not have any physical stores, they do not have to bear the costs associated with developing and maintaining physical stores, but they

virtual merchants single-channel e-commerce firms that generate almost all their revenue from online sales

FIGURE 9.4 SHARE OF ONLINE RETAIL SALES BY TYPE OF COMPANY



Virtual merchants account for 47% of online retail sales, although this percentage is heavily skewed by the dominance of Amazon, which by itself accounts for more than 35%.

SOURCES: Based on data from Digital Commerce 360 Research, 2022; Young, 2022; authors' estimates.

do face large costs in building and maintaining an e-commerce presence, building an order fulfillment infrastructure, and developing a brand name. Customer acquisition costs are high, and the learning curve is steep. Like all retail firms, their gross margins (the difference between the retail price of goods sold and the cost of goods to the retailer) are low. Therefore, virtual merchants must achieve highly efficient operations in order to preserve profits while building a brand name as quickly as possible in order to attract sufficient customers to cover their costs of operations. Most merchants in this category adopt low-cost and convenience strategies that are coupled with extremely effective and efficient fulfillment processes to ensure customers receive what they ordered as quickly as possible. In the following *E-commerce in Action* case, we take an in-depth look at the strategic and financial situation of Amazon, the leading online virtual merchant. In addition to Amazon, other successful virtual merchants include Wayfair and Overstock (furniture and home furnishings); Carvana and Vroom (automobiles); Chewy (pet products); Newegg (computers and consumer electronics); Zulily, Rue La La, Bluefly, and Yoox Net-a-Porter (fashion and apparel); and Zappos and Shoes.com (footwear). Virtual merchants that use a subscription revenue model have also become very popular and are expected to generate around $33 billion in revenue in 2022. Examples include Birchbox (personalized beauty samples delivered monthly), Stitch Fix (previously discussed in the *Insight on Technology* case, *Stitch Fix Builds a Business on Big Data and Artificial Intelligence*), Barkbox (pet supplies), Naturebox (healthy snacks), Bulu Box (supplements and vitamins), Blue Apron (meal plans), and thousands more. Virtual merchants (including Amazon) accounted for almost half (about 47%) of all online retail revenue generated by the 2022 Digital Commerce 360 Top 1000 online retailers (Digital Commerce 360 Research, 2022; Young, 2022; Insider Intelligence/eMarketer, 2022g.).

E-COMMERCE IN ACTION

AMAZON

Amazon, the Seattle-based virtual merchant, is one of the largest and most well-known companies in the world. Amazon's objective is to be Earth's most customer-centric company. In pursuing this goal, Amazon's founder, Jeff Bezos, and his team have built the world's most successful and innovative online retailer.

Few business enterprises have experienced the roller-coaster ride that Amazon has, from explosive early growth to huge losses, and then on to profitability. No other online business has been both so widely reviled and so hotly praised throughout its development. While controversial, Amazon has also been one of the most innovative online retailing stories in the history of e-commerce. From the earliest days of e-commerce, Amazon has continuously adapted its business model based on both its market experience and its insight into the online consumer. However, the Covid-19 pandemic presented a significant challenge to Amazon, a challenge that it met with success but also with some failures.

The Vision

The original vision shared by Jeff Bezos and other successful e-commerce pioneers was that the Internet would enable a revolutionary new form of commerce and that only the companies that became really big early on (ignoring profitability) would survive. The path to success, according to Bezos, was to offer consumers three things: the lowest prices, the best selection, and the most convenience. Currently, Amazon offers consumers millions of unique new, used, and collectible items in a variety of different categories, both physical and digital, all with user-generated reviews. Its physical goods categories include clothing, shoes, jewelry, and watches; books; movies, music, and games; electronics; computers; home, garden, and tools; pet supplies; food and grocery; beauty and health; toys, kids, and baby; sports; outdoor; and automotive and industrial, among others. Its digital product categories include Prime video; Amazon Music, Echo and Alexa, Fire TV, Audible Books, and Kindle e-book readers and books; among others. And if Amazon does not carry it, it is likely that one of its third-party sellers does. In short, Amazon has become the largest one-stop online marketplace—a kind of combined "shopping portal" and "product search portal" that puts it in direct competition with other omnichannel retail chains, eBay, and even Google—as well as an online media company that develops and produces content. In addition, Amazon offers cloud computing services through its Amazon Web Services (AWS) division. Amazon has also become a major online advertising network. As Amazon succeeded in becoming the world's largest online store, it also expanded its original vision to become one of the largest suppliers of online merchant and technology services as well as online content.

Business Model

Amazon's business is divided into three segments: North American, International, and AWS. Within the North American and International segments, it serves not only retail customers but also merchants. The e-commerce retail component of the business sells physical and digital products that Amazon has purchased and then resells to consumers just like a traditional retailer. Although Amazon started out as an online merchant of books, CDs, and DVDs, it has since diversified into becoming a general merchandiser of millions of other products. The company also sells products under its own private labels, such as Amazon Basics. Amazon has additionally turned itself into a major online media and content firm and, following its success with Kindle e-books, has also made a strong move into the music and streaming video business, with Amazon Music and Amazon Prime Video. It also manufactures and sells a variety of versions of its Kindle e-reader, its Amazon Fire tablet, and its Amazon Echo series of devices. Although the Amazon Fire smartphone proved unsuccessful, the Echo voice-activated speaker, with intelligent assistant Alexa, has garnered a commanding position in the rapidly growing market for these devices. The e-commerce retail segment of its business generated sales of $222 billion in 2021, accounting for about 47% of its total revenues.

Another major component of Amazon's business is its third-party merchant services segment. Amazon Services enables third parties to integrate their products into Amazon's website and use Amazon's customer technologies. Thousands of merchants have signed on with Amazon, offering products that in some instances compete with those that Amazon itself sells. For instance, a single product on the Amazon website may be listed for sale simultaneously by Amazon, by a large merchant participant such as Target, and by a small- or medium-sized business or individual selling a new, used, or collectible version of the product through Amazon Marketplace. For these types of

merchants, Amazon is not the seller of record and does not own the products, and the shipping of products is usually handled by the third party (although in some instances, Amazon provides fulfillment services as well). Amazon collects a monthly fixed fee, sales commission (generally estimated to be between 10% and 20% of the sale), per-unit activity fee, or some combination thereof from the third party. In this segment, Amazon acts as an online shopping mall, collecting "rents" from other merchants and providing "site" services such as order entry and payment. Amazon's third-party-seller services generated about $104 billion in 2021, representing about 22% of its total revenues.

AWS is another major part of Amazon's business. Through this segment, Amazon offers scalable computing power and storage space for businesses that do not have their own hardware infrastructure and provides developers with direct access to Amazon's technology platform, allowing them to build their own applications based on that platform. In 2021, AWS accounted for more than $62 billion in revenues, a 37% increase over the previous year and representing about 13% of Amazon's total revenues. AWS delivers more profits than Amazon's entire retail business. Refer to Chapter 3 for a more detailed examination of AWS.

Subscription services generated about $32 billion in revenue for Amazon in 2021, about 7% of its total revenues. Subscription services include the annual and monthly fees associated with Amazon Prime membership, which for $139 a year provides free two-day and in some instances one-day shipping as well as free access to Prime Music and Prime Video and free access to other digital video, audiobook, music, and e-book subscriptions. An estimated 88 million households (about 67% of all households) in the United States are Amazon Prime subscribers.

A newer initiative for Amazon has been the development of its own online advertising network, Amazon Ads, which in 2021 generated about $31 billion, almost as much revenue as was generated by subscription services. Amazon has become the third-largest digital advertising company in the United States, behind only Google and Meta. About two-thirds of Amazon's digital ad revenues come from its two on-site search ad products: Sponsored Product ads, which appear as product listings alongside organic search results, and Sponsored Brand ads, which are keyword-targeted and appear above organic search results. More than 60% of U.S. consumers start their search for products on Amazon rather than on a search engine, so these types of ads are very attractive to marketers. Display ads, both on-site and those sold by Amazon's programmatic ad network (see Chapter 6), comprised the remainder of its ad revenues.

Revenues from physical stores (primarily Whole Foods, which it purchased in 2017 for $13.7 billion) and Amazon's own physical stores such as Amazon Go, which allow shoppers to grab their food and have it charged to their Amazon account without having to stop to pay or have items scanned by a cashier, accounted for about $17 billion in 2021, about 3.6% of Amazon's total revenue.

In addition to Amazon.com in the United States, Amazon also operates a number of localized sites in Europe, Asia, and Canada. Amazon derived 27% of its gross revenue internationally in 2021, generating more than $127 billion, but also had a $925 million operating loss.

Financial Analysis

Amazon's revenues have increased from about $600 million in 1998 to an astounding $470 billion in 2021 (see **Table 9.4**). This is very impressive, explosive revenue growth. However, in the past, Amazon's aggressive pursuit of growth made it difficult for the

TABLE 9.4 AMAZON'S CONSOLIDATED STATEMENTS OF OPERATIONS AND SUMMARY BALANCE SHEET DATA 2019–2021

CONSOLIDATED STATEMENTS OF OPERATIONS (in millions)			
For the fiscal year ended December 31,	**2019**	**2020**	**2021**
Revenue			
Net sales/products	$160,408	$215,915	$241,787
Net sales/services	120,114	170,149	228,035
Total net sales	**280,522**	**386,064**	**469,822**
Cost of sales	165,536	233,307	272,344
Gross profit (Total net sales minus cost of sales)	**114,986**	**164,757**	**197,478**
Gross margin	**41%**	**42.7%**	**42%**
Operating expenses			
Marketing	18,878	22,008	32,551
Fulfillment	40,232	58,517	75,111
Technology and content	35,931	42,740	56,052
General and administrative	5,203	6,668	8,823
Other operating expense (income), net	201	(75)	62
Total operating expenses	100,445	129,858	172,599
Income from operations	**14,541**	**22,899**	**24,879**
Operating margin	**5.2%**	**5.9%**	**5.3%**
Total non-operating income (expense)	(565)	1,279	13,272
Income before income taxes	13,976	24,178	38,151
Provision for income taxes	(2,374)	(2,863)	(4,791)
Equity-method investment activity, net of tax	(14)	16	4
Net income (loss)	**11,588**	**21,331**	**33,364**
Net margin	**4.1%**	**5.5%**	**7.1%**
SUMMARY BALANCE SHEET DATA (in millions)			
At December 31,	**2019**	**2020**	**2021**
Assets			
Cash, cash equivalents, and marketable securities	55,021	84,396	96,049
Total current assets	96,334	132,733	161,580
Total assets	225,248	321,195	420,549
Liabilities			
Total current liabilities	87,812	126,385	142,266
Long-term liabilities	163,188	227,779	282,304
Working capital	8,522	6,348	19,314
Stockholders' equity	62,060	93,404	138,245

SOURCE: Based on data from Amazon.com, Inc., 2022a.

company to maintain consistent profits. From 2011 to 2014, Amazon boomeranged from losses to profitability on a yearly basis, but it strung together a series of profitable years from 2015 through 2021. In 2020 and 2021, Amazon was severely challenged by the Covid-19 pandemic. The pandemic impacted its supply chain, logistics, and third-party-seller operations as well as consumer purchasing behavior. However, despite these challenges, Amazon increased its net revenues by 22%. Its income from operations also grew by 8.6%. In addition, its overall net income grew significantly; however, this growth was due in large part to the increase in value of its investment in electric vehicle manufacturer Rivian Automotive Inc. (reflected in Amazon's total non-operating income for 2021), which went public in 2021.

At the end of December 2021, Amazon had about $96 billion in cash and marketable securities. Total assets were more than $420 billion. The company points to the amount of its "free cash flow" as a sign of financial strength, suggesting that it has more than enough cash available to cover short-term liabilities (such as financing holiday season purchasing and major acquisitions). Amazon's current assets should certainly be enough to cover future short-term deficits, should they occur. Overall, Amazon reached the end of 2021 in very good financial shape. However, in 2022, Amazon recorded a net loss of about $5.9 billion for the first six months of the year. For more information, see the Future Prospects section of this case.

Strategic Analysis—Business Strategy

Amazon engages in a number of business strategies that seek to maximize revenue growth. These strategies include driving the growth of e-book sales by offering enhancements of its Kindle e-reader and Kindle Fire tablet computer as well as offering new e-book publishing initiatives; expanding further into the device manufacturing business, with Amazon Fire TV, Amazon Echo/Alexa, and smart home products such as those created by Ring, which Amazon acquired for $1 billion, and iRobot, which it acquired for $1.7 billion; expanding its streaming music and video businesses, with its Amazon Music and Amazon Prime Video services; moving toward a broader trading platform by expanding the third-party-seller segment; continuing to grow its Amazon Business B2B marketplace segment (for more on Amazon Business, see the Chapter 12 opening case); and moving toward greater product focus by grouping its offerings into major categories that it calls "stores." It also creates special events that drive overall sales, such as Prime Day, an online version of Black Friday that generated almost $12 billion in gross merchandise sales in 2021, compared to $4 billion in 2018. In addition to online retail, Amazon has focused on expanding and extending the geographic reach of its AWS offerings and developing its own digital advertising network.

Amazon has moved decisively into m-commerce as well, with shopping apps for the iPhone, Android, and iPad. Amazon maintains a dominant position in m-commerce in 2022, with more than 100 million people in the United States using its app.

Amazon has continued to build on the rousing success of its Kindle e-book reader platform, which it has touted as the best-selling product in its history, by releasing new iterations of the Kindle e-book reader and the Amazon Fire tablet. According to Amazon, it now sells more Kindle books than all print books combined.

Amazon has partnered with nearly every major film and television studio to add content to its Prime Video library. It has also developed a number of original series to

keep pace with competitors such as Netflix, Hulu, and others. In 2015, Amazon's content creation arm, Amazon Studios, began to develop original movies for theatrical release, a number of which have been critical successes, such as *Manchester by the Sea*, which became the first movie produced by a streaming service to win an Academy Award. Amazon Prime Video is now available in more than 200 countries.

On the cost side, Amazon had an aggressive strategy to build warehouses across the country to improve its delivery speeds. It currently has 305 large fulfillment centers, as well as more than 1,100 distribution centers, around the United States. It is expected to slow the future expansion of its fulfilment network because it currently has more capacity than it needs. Amazon is also focusing on beating its competitors in delivery speed, with same-day delivery in many areas of the country.

To that end, Amazon has taken steps to expand its delivery capability in several ways, including drone delivery and cargo jets. Amazon Prime Air is Amazon's drone delivery project, which would be capable of delivering packages up to five pounds in weight—upward of 80% of all shipments. Until recently, this type of delivery method seemed closer to science fiction than to reality, but Amazon appears closer than ever to making it work despite the engineering and legal hurdles, with the first drone deliveries expected to begin later in 2022. Amazon also has a fleet of 75 cargo jets to help manage its ever-increasing shipping demands. In addition, the company has a fleet of its own trucks and is investing heavily in the development of all-electric delivery vehicles. Although it may look like Amazon is trying to take full control of its delivery operations, Amazon isn't likely to end its relationships with FedEx and UPS—the overall volume of its orders has become too large for that. It also continues to use the U.S. Postal Service for some types of shipping. However, these moves could dramatically improve per-order profit margins for the majority of Amazon orders, making life even more difficult for Amazon's traditional bricks-and-mortar competitors.

Strategic Analysis—Competition

Major competitors include omnichannel retailers such as Walmart and Target and online-only competitors such as eBay, Wayfair, and Etsy. Although Walmart was initially slow to develop e-commerce capabilities, in recent years it has made a host of acquisitions to improve its e-commerce presence, and today it ranks second to, although still far behind, Amazon in terms of U.S. retail e-commerce sales. Walmart has also begun offering free two-day shipping, the ability to quickly reorder items frequently purchased, and online grocery service, an area in which its 4,700 stores in the United States dwarf the 460 stores Amazon acquired from Whole Foods, giving Walmart a much more robust network for delivering goods. Walmart and Amazon are each trying to become more like the other—Walmart already has the physical infrastructure that Amazon is racing to build, whereas Amazon's e-commerce capability is far more advanced than Walmart's. Walmart has completely redesigned its website, dramatically simplifying it with a minimalist, image-heavy design that stands in sharp contrast to the Amazon website's home page (for more on Walmart's website redesign and omnichannel strategy, see the Chapter 4 opening case). Amazon still firmly has the upper hand in this battle of the titans, but Walmart has improved its e-commerce operations enough to

secure its place as Amazon's biggest competitor going forward. Walmart's performance, particularly its online grocery operations and pickup services during the Covid-19 pandemic, has put it in a strong position. The biggest threat to Amazon's international expansion efforts is China-based Alibaba, which handles more business worldwide than eBay and Amazon combined. Amazon continues to pursue an aggressive strategy internationally, with both the launch of localized versions of its website and acquisitions such as its purchase of Souq.com, which is perhaps the most prominent e-commerce company in the Middle East.

Amazon has also fully engaged in competition in the music, television, and movie industries. Amazon Music Unlimited allows users to stream music online (as well as download music for offline use), offers 90 million songs and podcasts, and can be played on virtually any device and managed with any music software. Amazon Prime Music offers 2 million tracks that users can stream for free. Amazon Prime Video provides access to streaming video content, including more than 24,000 movies and tens of thousands of television show episodes for free to Amazon Prime members, as well as additional content that can be rented or purchased à la carte.

Strategic Analysis—Technology

Anyone who believes that information technology doesn't make a difference clearly does not know much about Amazon. Amazon arguably has the largest and the most sophisticated collection of online retailing technologies available from any single company. It has implemented numerous website management, search, customer interaction, recommendation, transaction-processing, and fulfillment services and systems using a combination of its own proprietary technologies and commercially available, licensed technologies. Amazon's transaction-processing systems handle millions of items, numerous status inquiries, gift-wrapping requests, and multiple shipment methods. Customers can receive orders in single or multiple shipments, based on availability, and can track the progress of each order. On the fulfillment side, every warehouse employee carries a shoehorn-sized device that combines a bar code scanner, a display screen, and a two-way data transmitter. The sheer size and scope of Amazon's technological capability was the motivation for the launch of AWS, which controls about 34% of the cloud computing marketplace worldwide in 2022, compared to 21% for Microsoft Azure and 10% for Google Cloud Platform. Amazon also continues to invest in new versions of the Kindle e-reader and consumer electronics such as the Amazon Fire devices, as well as in projects like drone delivery and smart home products such as its Ring camera line and the Amazon Echo home assistant. Powered by its state-of-the-art speech recognition, cloud connectivity, and Alexa artificial intelligence technology, the Echo has a diverse array of features that range from streaming music, doing math, updating to-do lists, getting the weather, playing games, and much more. In July 2022, Amazon expanded its lineup of smart home products with the purchase iRobot for $1.7 billion.

Strategic Analysis—Social and Legal Challenges

Amazon faces a number of social and legal challenges. The Covid-19 pandemic raised questions about Amazon's treatment of its workers, who have publicly criticized Amazon and filed lawsuits charging that working conditions have put them at risk. Amazon has also been subject to governmental investigations about its response to the crisis.

Amazon continually faces lawsuits concerning various aspects of its business. Most common are patent infringement suits, which are largely settled out of court. More significant are government investigations in both Europe and the United States based on antitrust concerns surrounding Amazon's market dominance and the actions that it has taken, and continues to take, to achieve that dominance. For more information on this issue, see the Chapter 8 case study *Are Big Tech Firms Getting "Too Big"?*.

Future Prospects

In 2016, Amazon finally began to show investors and analysts what they had been waiting years to see: sustainable profitability. The profitability of its AWS unit is a major positive for Amazon, with revenues from AWS continuing to rapidly grow. Subscription revenue from Amazon Prime memberships is also a key component of the company's strong performance, as are the increasing revenues and profits deriving from its newer, Amazon Ads unit. However, Amazon has reached its current position of dominance in e-commerce by defying analysts' expectations, and the company continues to spend prodigiously, potentially compromising profitability in the process. As previously noted, Amazon posted a net loss for the first six months of 2022, and revenue grew at the lowest percentage (only about 7%) in about two decades, in part due to the economic climate (inflationary pressure crimping consumer spending power; consumers returning to stores after Covid-19; and continuing global uncertainty due to the persistence of supply chain shortages as well as Covid-19). During the pandemic, Amazon decided to aggressively expand its warehouse and logistics infrastructure, and with reduced consumer demand, Amazon is working to reduce those costs. It expects this effort to continue into at least the third quarter of 2022. That said, Amazon also continues to expand in other areas. In July 2022, for example, it purchased 1Life Healthcare, an operator of 180 primary health care clinics, for $3.9 billion, signaling an expansion of a smaller service that Amazon had launched in 2019. It's anyone's guess what Amazon will look like in a few years' time (Amazon.com, Inc., 2022a, 2022b; Jungle Scout, 2022; Mattioli, 2022; Evans and Herrara, 2022).

OMNICHANNEL MERCHANTS: BRICKS-AND-CLICKS

Omnichannel merchants (also called **bricks-and-clicks** companies) have a network of physical stores as their primary retail channel but also have online offerings. Successful omnichannel firms include Walmart, Target, Home Depot, Best Buy, Costco, Macy's, and other brand-name merchants. Although omnichannel merchants face high costs of physical buildings and large sales staffs, they also have many advantages such as a brand name, a national customer base, warehouses, a large scale (giving them leverage with suppliers), and a trained staff. Acquiring customers is less expensive because of their brand names, but these firms face challenges in coordinating prices across channels and handling returns of online purchases at their retail outlets. However, these retail players are accustomed to operating on very thin margins and have invested heavily in purchasing and inventory control systems to control costs and in coordinating returns from multiple locations. Omnichannel companies face the challenges of leveraging

omnichannel merchants (bricks-and-clicks) companies that have a network of physical stores as their primary retail channel but have also introduced online offerings

their strengths and assets to the Web; building a credible website; hiring new, skilled staff; and building rapid-response order entry and fulfillment systems. Omnichannel merchants accounted for around 32% of all online retail revenue generated by the 2022 Digital Commerce 360 Top 1000 online retailers (Digital Commerce 360 Research, 2022; Young, 2022).

Macy's is a good example of a traditional merchant that is based on physical stores but that has moved to become an omnichannel retailer. Rowland H. Macy opened the first R.H. Macy & Co. store in New York City in 1858 and moved the flagship store (now the site of the famous Macy's Thanksgiving Day parade) to Herald Square at 34th Street and Broadway in 1902. Today, Macy's is one of the largest national department store chains, with around 650 Macy's department stores throughout the United States.

Like many traditional retailers, Macy's had to change its business model to accommodate the Internet. Macy's (then called Federated Department Stores Inc.) jumped into e-commerce in 1995 with the creation of the Macys.com website. In 1999, Federated bought Fingerhut, at that time a leading catalog and direct marketer, in part for Fingerhut's expertise in e-commerce fulfillment and database management. Although the Fingerhut acquisition did not prove to be a financial success, Macy's e-commerce efforts benefitted from the acquisition.

Macy's ranked 12th in terms of U.S. retail e-commerce revenues for 2021, with an estimated $8.9 billion in online sales, representing around 35% of its total sales. Growth of its physical store sales pales by comparison, and Macy's has closed a number of stores as it focuses increasingly on its e-commerce operations.

The Macy's website includes an interactive catalog, enlarged product views, and the ability to see products in different colors and from alternate views, including via videos. It also offers product comparisons, product ratings, and product recommendations as well as a real-time inventory check system. Macy's website attracts around 75 million unique visitors a month. In 2022, it announced a revamp of the website that will feature a customized dashboard showcasing visitors' shopping histories, rewards points, upcoming orders, and style recommendations. It has also launched a weekly livestreaming shopping experience, Macy's Live. Macy's has an Instagram account with about 2.2 million followers, a Pinterest page with 20 different boards and 1.3 million followers, a Twitter feed with around 900,000 followers, a TikTok feed with about 500,000 followers, and a YouTube channel with almost 25 million views. Macy's was also an early adopter of Buyable Pins introduced by Pinterest. In addition, Macy's has launched an influencer program that it calls Macy's Style.

M-commerce is an important part of Macy's online success: It has iPhone and Android apps and an HMTL5 mobile website. It has redesigned both its mobile app and its website in order to more closely integrate them with its physical stores. Its most recent app update, in October 2021, allows shoppers to curate their personal style and create lists of their favorite products. The app update also improved product filters, personalized recommendations, and streamlined the returns process.

Macy's also continues to focus on refining its omnichannel approach, encompassing its physical stores, its website, and its mobile platform. Macy's chief financial officer has noted that customers who shop both online and offline spend 2.5 to 3.5 times more, and around three times more frequently, than those who shop via a single channel only. Macy's offers a number of key omnichannel features including buy online, pickup in

store (BOPIS)/click-to-collect; curbside pickup; customer assistance services; the ability to make an in-store appointment online; shipping from a store; a store locator on its website; and in-store returns of items purchased online. BOPIS/click-to-collect orders increased by more than 25% in 2021, to around $2.1 billion, a very positive development, given that such orders are more profitable for Macy's because they eliminate the cost of shipping the items. In addition, Macy's has found that online shoppers typically spend an additional 25% when they order online and then pick up items in the store. Macy's is also continuing to focus on integrating its in-store and mobile experiences. Shoppers in a store can scan a product with Macy's mobile app to find out the price, make the purchase through the app, and then have the item delivered to their homes. Macy's also now offers enhanced mobile checkout in all of its physical stores. It was among the first retailers to support Apple Pay, Apple's mobile payment system, offering it in addition to Macy's own mobile wallet, which allows shoppers to virtually store and access offers and coupons.

Macy's is also jumping onto digital marketplace bandwagon, and in the third quarter of 2022, expects to launch its own curated digital marketplace in partnership with platform company Mirakl. The marketplace will allow selected third-party merchants to sell an assortment of products in the home, kids, baby and maternity, beauty and health, toys, and electronics categories on Macys.com, including brands that Macy's currently does not offer.

Macy's, like all omnichannel retailers, obviously faces significant challenges as a result of the Covid-19 pandemic and uncertain economic conditions in 2022. Macy's chief executive officer, Jeff Gennette, noted that the crisis indicated the importance of having a friction-free omnichannel strategy and that its goal going forward is to offer a best-in-class omnichannel experience. (Bloomberg, 2022; Berthene, 2020, 2022; Marks, 2022; Walk-Morris, 2021; Lauchlan, 2020).

MANUFACTURER-DIRECT

Manufacturer-direct (also sometimes referred to as **direct-to-consumer [DTC** or **D2C]**) firms are either single- or multi-channel manufacturers that sell directly online to consumers without the intervention of retailers. Manufacturer-direct firms were originally predicted to play a very large role in e-commerce, but initially this did not happen. However, today, DTC has become a thriving business model, particularly in the computer hardware industry (Apple, Dell, and HP) and for apparel manufacturers (Ralph Lauren, Nike, Under Armour, Carter's, Tory Burch, Deckers, Kate Spade, Jones Retail, Vera Bradley, and many others). Consumer products manufacturers originally did not sell directly online, but this too has started to change. For instance, Procter & Gamble offers Pgshop, which carries more than 50 different Procter & Gamble brands. Manufacturer-direct firms accounted for about 17.5% of all online retail revenue generated by the 2022 Digital Commerce 360 Top 1000 online retailers (Digital Commerce 360 Research, 2022; Young, 2022). Within the last decade, a new breed of manufacturer-direct firms has also emerged, sometimes referred to as digital native D2C verticals. **Digital native D2C verticals** are online startup companies focused on direct sourcing of materials, control of their distribution channel, and direct connection to the consumer. They are expected to generate about $38 billion in revenue in 2022. Examples include companies selling eyeglasses (Warby Parker), apparel (Stitch Fix, Everlane, MM. LaFleur, and

manufacturer-direct (direct-to-consumer) (DTC/D2C)
single- or multi-channel manufacturers that sell directly online to consumers without the intervention of retailers

digital native D2C verticals
online startup companies focused on direct sourcing of materials, control of their distribution channels, and direct connection to the consumer

Draper James), mattresses (Casper, Purple, Saatva, and Leesa Sleep), bedding products (Parachute and Brooklinen), beauty products (Glossier and Morphe Cosmetics), and luggage (Away), among many others (Insider Intelligence/eMarketer, 2022h).

channel conflict occurs when retailers of products must compete on price and currency of inventory directly against the manufacturers

supply-push model products are made prior to orders received based on estimated demand

demand-pull model products are not built until an order is received

Manufacturer-direct firms sometimes face channel conflict challenges. **Channel conflict** occurs when retailers of products must compete on price and currency of inventory directly against the manufacturer, who does not face the costs of maintaining inventory, physical stores, or sales staffs. Firms with no prior direct marketing experience face the additional challenges of developing a fast-response online order and fulfillment system, acquiring customers, and coordinating their supply chains with market demand. Switching from a **supply-push model** (where products are made prior to orders received based on estimated demand and then stored in warehouses awaiting sale) to a **demand-pull model** (where products are not built until an order is received) has proved extremely difficult for traditional manufacturers. Yet for many products, manufacturer-direct firms have the advantages of an established national brand name; an existing, large customer base; and a lower cost structure than even catalog merchants because they are the manufacturer of the goods and thus do not pay profits to anyone else. Therefore, manufacturer-direct firms should have higher margins.

Dell Technologies is one of the most frequently cited manufacturer-direct retailers. Dell operates in both the B2C and the B2B arenas and is the world's largest direct computer systems supplier, providing corporations, government agencies, small- to medium-sized businesses, and individuals with computer products and services ordered straight from the manufacturer's headquarters in Austin, Texas. Although sales representatives support corporate customers, individuals and smaller businesses buy directly from Dell via phone, fax, and the Internet.

When Michael Dell started the company in 1984 in his college dorm room, his idea was to custom-build computers for customers, to eliminate the middleman, and to more effectively meet the technology needs of customers. Today, the company sells much more than individual computer systems; it also offers enterprise systems and desktop/laptop computers, as well as installation, financing, repair, and management services. By relying on a build-to-order manufacturing process, the company achieves faster inventory turnover (five days) and reduced component and finished goods inventory levels; this strategy virtually eliminates the chance of product obsolescence.

The direct model simplifies the company's operations, eliminating the need to support a wholesale and a retail sales network, as well as cutting out the costly associated markup, and gives Dell complete control over its customer database. In addition, Dell can build and ship custom computers nearly as quickly as a mail-order supplier can pull a computer out of inventory and ship it to the customer.

To extend the benefits of its direct sales model, Dell has aggressively moved sales, service, and support online. Dell's website serves customers in 190 countries around the world. Dell's Premier service enables companies to investigate product offerings, complete order forms and purchase orders, track orders in real time, and review order histories—all online. For its small business customers, it has created an online virtual account executive as well as a spare-parts ordering system and a virtual help desk with direct access to technical support data. Dell has also continued to broaden its offerings beyond just hardware product sales, adding warranty services, product integration and installation services, Internet access, software, and technology consulting, referring to them as "beyond the box" offerings.

These include nearly 30,000 software and peripheral products from leading manufacturers that can be bundled with Dell products. Dell has also embraced social media. It has a corporate blog, a LinkedIn page with 4.1 million followers, as well as a presence on Facebook (with about 1.5 million followers), Instagram, Pinterest, and Twitter. It posts Twitter-exclusive sales for those who follow Dell Outlet and has used Instagram's Stories feature to post product showcases as well as to directly sell products. It also has a channel on YouTube with almost 75 million views. In addition, it has mobile apps for the iPhone and Android that feature in-app purchasing, customer ratings and reviews, product comparison, order tracking, a Shopping Advisor, and easy access to various customer support options. Its mobile website uses responsive design, allowing the site to automatically adapt to consumers' devices. According to Dell, its e-commerce channel plays a critical role in handling strong demand for work-at-home technology (Dell Technologies, Inc., 2021).

CATALOG MERCHANTS

catalog merchants established companies that have a national offline catalog operation that is their largest retail channel but that have also developed online capabilities

Catalog merchants such as Lands' End, L.L.Bean, CDW Corp., PC Connection, and Cabela's are established companies that have national offline catalog operations but that have also developed online capabilities. Catalog merchants face very high costs for printing and mailing millions of catalogs each year—many of which have a half-life of 30 seconds after the customer receives them. Catalog merchants typically have developed centralized fulfillment and call centers, extraordinary service, and excellent fulfillment in partnership with package delivery firms such as FedEx and UPS. Catalog firms have suffered in recent years as catalog sales growth rates have fallen. As a result, catalog merchants have had to diversify their channels by building stores (L.L.Bean), being bought by store-based firms (Sears purchased Lands' End in 2003 before spinning it off again as an independent public company in 2014), or by building a strong online presence.

Catalog firms were uniquely advantaged during the early days of e-commerce because they already possessed very efficient order entry and fulfillment systems. However, they later faced many of the same challenges as physical retailers—they had to leverage their existing assets and competencies to a new technology environment, build a credible online presence, and hire new staff. As time has passed, the catalog merchant business model has become less relevant, with catalog merchants accounting for only about 2.7% of all online retail revenue generated by the 2022 Digital Commerce 360 Top 1000 online retailers (Digital Commerce 360 Research, 2022; Young, 2022).

Today, one of the most well-known online catalog merchants is LandsEnd.com. Lands' End started out in 1963 in a basement of Chicago's tannery district selling sailboat equipment and clothing, handling 15 orders on a good day. Since then, it has expanded into a direct catalog merchant, distributing more than 300 different catalogs involving around 20,000 unique printed pages a year that are distributed throughout the United States, Europe, and Japan. Lands' End product lines include "traditionally" styled sport clothing, soft luggage, and products for the home. It also now has a physical retail presence, which first began with its acquisition by Sears and has continued to grow in subsequent years.

Lands' End was one of the first apparel retailers to have an e-commerce-enabled website, launching in 1995 with 100 products and travelogue essays. In 2015, it launched a significantly redesigned website featuring a new online catalog with more brands, improved search and navigation, streamlined checkout, and new payment types such as Visa Pay. In 2016, it added a mobile app and made further improvements to its website.

Through the years, Lands' End has continued to invest in the e-commerce sales channel in an effort to make online shopping even more convenient for its customers.

Lands' End has always been on the leading edge of online retailing technologies, most of which emphasize personal marketing and customized products. Lands' End was the first online retailer to enable customers to create a 3-D model of themselves to "try on" clothing. Lands' End's "Get Live Help" enables customers to chat online with customer service representatives; Lands' End Custom allows customers to create custom-crafted clothing built for their personal measurements. Although customized clothing built online was thought to be a gimmick in the early years of online retailing, today, a significant percentage of Lands' End clothing sold online is customized. In 2021, Lands' End generated $1.2 billion in revenue from its U.S. and international e-commerce channels, accounting for more than 75% of its total revenue. Lands' End's U.S. e-commerce total customer database increased to 5.8 million customers. Features that garner praise include live video chat, product recommendations that reflect a shopper's preferences, content display based on a shopper's location and referral source, and mobile apps that deliver Lands' End catalogs to mobile users. The digital catalogs contain exclusive content, including stories written by Lands' End employees. Shoppers can also visit Lands' End on Facebook, where it has more than 1.3 million Likes. Lands' End also has a Twitter presence, an Instagram account, and a variety of Pinterest boards featuring its products. In 2021, Lands' End launched a new, third-party marketplace featuring offerings from partner brands (Lands' End, Inc., 2022a, 2022b; Censhare, 2021; Wassel, 2021).

9.4 THE SERVICE SECTOR: OFFLINE AND ONLINE

The service sector is the largest and most rapidly expanding part of the economy in the United States. In the United States, the service sector (broadly defined) employs about four out of every five workers and accounts for about 80% of the United States' gross domestic product (GDP) (FocusEconomics, 2022). E-commerce in the service sector offers extraordinary opportunities to deliver information, knowledge, and transaction efficiencies.

Major service industry groups include finance, Insurance, real estate, and travel services. Business, health, education, and professional services such as legal and accounting are also important service sector industries. Business services include activities such as consulting, advertising, marketing, and information processing. Within these groups, companies can be further categorized into those that involve **transaction brokering** (acting as an intermediary to facilitate a transaction) and those that involve providing a "hands-on" service. For instance, one type of financial service involves stockbrokers who act as the middle person in a transaction between buyers and sellers. Online mortgage companies such as LendingTree refer customers to mortgage companies that actually issue the mortgage. Job recruitment and career services companies put a "buyer" of labor in contact with a "seller" of labor. The service involved in all these examples is brokering a transaction.

transaction brokering
acting as an intermediary to facilitate a transaction

In contrast, some industries perform specific hands-on activities for consumers, and the parties providing the service need to interact directly and in-person with the "client." The Internet can assist providers of such services by enabling consumers to more easily find information about, and communicate with, those providers.

With some exceptions (for example, providers of physical services such as cleaning, gardening, and so on), perhaps the most important feature of service industries (and occupations) is that they are knowledge- and information-intense. In order to provide value, service industries process a great deal of information and employ a highly skilled, educated workforce. For instance, to provide legal services, you need lawyers with law degrees. Law firms are required to process enormous amounts of textual information; likewise with medical services. Financial services are not so knowledge-intensive but require much larger investments in information processing just to keep track of transactions and investments. In fact, the financial services sector is the largest investor in information technology, with more than 80% of invested capital going to information technology equipment and services.

Services differ in the amount of personalization and customization required, although just about all services entail some personalization or customization. Some services, such as legal, medical, and accounting services, require extensive personalization: adjusting a service to the precise needs of a single individual or object. Others, such as financial services, benefit from customization by allowing individuals to choose from a restricted menu. The ability of Internet and e-commerce technology to personalize and customize service, or components of service, is a major factor undergirding the extremely rapid growth of e-commerce services. Future expansion will depend in part on the ability of e-commerce firms to transform their customized services—choosing from a list—into truly personalized services, such as providing unique advice and consultation based on a digital yet intimate understanding of the client (at least as intimate as professional service providers).

9.5 ONLINE FINANCIAL SERVICES

The online financial services sector is a shining example of an e-commerce success story but is one with many twists and turns. Although innovative online firms such as E*Trade have been instrumental in transforming the brokerage industry, the impacts of e-commerce on the large, powerful banking, insurance, and real estate firms were delayed somewhat by initial consumer resistance and the lack of industry innovation. Even today, online-only banks have not displaced traditional banks. But e-commerce has nevertheless transformed the banking and financial industries, as the major institutions have deployed their own online applications to service an increasingly connected online customer base. Insurance has become more standardized and easier to purchase online. Although security is still a concern, consumers are much more willing to trust online sites with their financial information than they were in the past. Multi-channel, established financial services firms—the slow followers—also continue to show gains in online transactions. The Covid-19 pandemic, which limited consumers' ability to perform physical transactions, has accelerated the process.

FINTECH

In the last few years, increasing investments have been made in startup companies in the financial services industries. These companies are often referred to as fintech (which is short for "financial technology") companies and have attracted a lot of attention in the

popular press. The term *fintech* is poorly defined and has been applied to a wide variety of companies. The use of information technology in the financial services arena is not new. Financial services companies have long made very large investments in information technology. What distinguishes many fintech companies from the earlier iterations is that they are tech companies outside the traditional financial services industries that are seeking to use technology to unbundle traditional institutional financial services and instead deliver targeted solutions, often via mobile devices and apps. That said, the term *fintech* is also being applied to traditional financial services firms that are developing and implementing innovative technologies.

ONLINE BANKING

NetBank and Wingspan Bank pioneered online banking in the United States in 1996 and 1997, respectively. Although somewhat late to the game, the established brand-name national banks have now taken a substantial lead in market share as the percentage of their customers who bank online has grown rapidly. The top U.S. banks are all large, national banks that also offer online banking: Bank of America, JPMorgan Chase, Citigroup, and Wells Fargo. Major direct banks (those that operate without a network of branches or branded ATMs) in the United States include Ally Bank, TIAA Bank, Discover Bank, Capital One 360, Axos Bank, State Farm Bank, and USAA. These direct banks have seen customer deposits grow more quickly than they have in regular banks, indicating their growing popularity, particularly with younger customers.

A number of startups have also moved into the online banking space. For instance, Chime is the leading example of what is sometimes referred to as a *neobank*: an independent, digitally native, digital-only bank. Chime offers an FDIC-insured checking and savings account and a Visa debit card backed by The Bancorp Bank and has more than 18 million U.S. users as of 2022. Chime targets low-to-middle-income consumers with features aimed at building financial health. Aspiration, another popular neobank, is taking a different marketing approach. Aspiration bills itself as an "anti-bank" with a sustainability focus. It offers a suite of banking services, credit cards, and investment products that aim to be carbon-neutral. However, some critics have questioned how well it is living up to its claims (Kessler, 2021). Revolut, a U.K. fintech that launched in the United States in 2020 and has more than 20 million users worldwide, offers an app that enables users to manage their finances all in one place as well as access to more than 55,000 surcharge-free ATMs around the world.

In 2022, more than 210 million American adults (almost 80% of the adult U.S. population) are expected to use online banking, and this number is projected to grow to 225 million by 2026. More than 175 million will use mobile devices, with 160 million using a smartphone and 50 million using a tablet computer. The Covid-19 pandemic, which prevented many consumers from accessing their financial accounts from a physical location and required them to use online banking instead, significantly boosted the number of online banking users. Although online banking has become a primary banking channel for all age groups, Millennials and Gen Z-ers are adopting mobile banking at a much higher rate than are those who are older. Top mobile banking activities include checking balances and bank statements, transferring money from one account to another, paying bills, and depositing checks using smartphone apps that snap a photo of the check. However, security and privacy issues still deter some (Insider Intelligence, 2022i, 2022j). From the bank's perspective, online and mobile banking can provide significant cost savings.

ONLINE BROKERAGE

The history of online brokerage (stock trading) has been similar to that of online banking. Early innovators such as E*Trade (now part of Morgan Stanley, a traditional financial services firm) have been displaced from their leadership positions in terms of number of online accounts by discount broker pioneer Charles Schwab and financial industry giant Fidelity (which has more mutual fund customers and more funds under management than any other U.S. firm).

In the United States, a majority (55%) of the people who have brokerage accounts now interact digitally with online brokerage firms, with almost 85 million digital brokerage users in total. The use of mobile devices and apps for this purpose is increasing, particularly among Millennials and Gen Z-ers. The most frequent activities conducted on mobile devices include monitoring one's portfolio and the market, getting stock quotes, placing and checking on orders, and doing general financial research. Top online brokerage firms include Fidelity, E*Trade, Charles Schwab, TD Ameritrade, Vanguard, and Merrill. The major online brokerage firms invest significantly in search engine marketing and are among the biggest spenders in the paid search market. They are also increasingly using social media to engage with customers, although they must be careful to comply with all regulations and rules as they do so. For instance, some brokerage firms use Twitter to deliver commentary, company information, marketing, and customer service. Robinhood, launched in 2013, is a newer online brokerage that pioneered commission-free stock trading. Since then, Robinhood has broadened its focus to additional financial services and in 2022 has a market capitalization of more than $9.5 billion, but it also has been plagued by a number of missteps, including a $30 million fine by New York's financial regulators for significant failures in complying with anti–money laundering and cybersecurity rules and a class action suit against it based on its role in what has become known as the "meme stock" run involving GameStop and AMC stock in 2021. Similar firms include Public, which also offers free trading, Acorns, which offers a savings and investing app, and Commonstock, a social investing platform that can be linked to a brokerage account (Insider Intelligence/eMarketer, 2022k).

Another type of online financial service, sometimes referred to as robo-advisors, offers inexpensive, automated investment management tools and advice. The leading example of a fintech robo-advisor is Betterment, which as of 2022 has more than $30 billion in assets under management and more than 700,000 customers. Other robo-advisors that originally began as independent companies, such as Wealthfront, and Personal Capital, have subsequently been acquired: in the case of Wealthfront, by JP Morgan, and in the case of Personal Capital, by Canadian insurer Empower Retirement. Similar services are also offered by major U.S. online brokerage firms such as Vanguard and Schwab.

ONLINE MORTGAGE AND LENDING SERVICES

During the early days of e-commerce, hundreds of firms launched online-only mortgage websites to try to capture the U.S. home mortgage market. Early entrants hoped to radically simplify and transform the traditional mortgage value chain process, dramatically speed up the loan closing process, and share the economies with consumers by offering lower rates.

However, by 2003, more than half of these early entry, online-only firms had failed. Early online-only mortgage institutions had difficulties developing a brand name at an affordable price and failed to simplify the mortgage generation process. They ended up

suffering from high startup and administrative costs, high customer acquisition costs, rising interest rates, and poor execution of their strategies.

Despite this rocky start, the online mortgage market is growing, albeit slowly; it is dominated by established online banks and other online financial services firms, traditional mortgage vendors, and a few successful online mortgage firms.

Many mortgage shoppers research mortgages online, and they are increasingly beginning to apply online. For instance, Rocket Mortgage allows borrowers to be fully approved for a mortgage in less than 10 minutes. The applicant needs only to provide a few details, such as birth date, social security number, and home address, and then Rocket Mortgage uses that data to automatically obtain various types of information without the need for the borrower to manually provide any further documentation. The system then displays various loan options, and once the borrower selects an option, all necessary documents (except for final closing documents) can be signed online using a secure portal. As of 2021, Rocket Mortgage is one of the largest mortgage lenders by volume in the United States and has funded more than $1.5 trillion in home mortgages since its inception (Rocket Companies, Inc., 2022).

Consumer benefits from online mortgages include reduced application times, market interest rate intelligence, and process simplification that occurs when participants in the mortgage process (title, insurance, and lending companies) share a common information base. Mortgage lenders benefit from the cost reduction involved in online processing of applications, which allows them to charge rates that are marginally lower than the rates of traditional bricks-and-mortar institutions.

Nevertheless, the online mortgage industry has not transformed the process of obtaining a mortgage. A significant brake on market expansion is the complexity of the mortgage process, which requires physical signatures and documents, multiple institutions, and complex financing details—such as closing costs and points—that are difficult for shoppers to compare across vendors. Nevertheless, as in other areas, the ability of shoppers to find low mortgage rates online has helped reduce the fees and interest rates charged by traditional mortgage lenders.

Online lending services have also become popular. Examples of fintech companies in this area include Lending Club, a peer-to-peer (P2P) lender that went public in 2014; Social Finance Inc. (SoFi), now also a public company, which focuses primarily on student loans; Prosper, a P2P lending marketplace that has facilitated more than $22 billion in loans to more than 1.3 million people; Avant, which uses machine learning and analytics as well as consumer data to determine how much credit it will offer to potential customers; and Kabbage, a small business lender that also uses machine learning, public data, and other information to determine the creditworthiness of small businesses.

ONLINE INSURANCE SERVICES

Term life insurance stands out as one product group supporting the conventional wisdom that the Internet lowers search costs, increases price comparisons, and decreases prices to consumers. Term life insurance is a commodity product, however. Insurance companies continue to have opportunities for product and service differentiation and price discrimination with respect to other types of insurance.

The insurance industry forms a major part of the financial services sector. It has four major segments: automobile, life, health, and property and casualty.

Insurance products can be very complex. For example, there are many different types of non-automotive property and casualty insurance: liability, fire, homeowners, commercial, workers' compensation, marine, accident, and other lines such as vacation insurance. Writing an insurance policy in any of these areas is very information-intense, often necessitating personal inspection of the properties, and it requires considerable actuarial experience and data. The life insurance industry has also developed life insurance policies that defy easy comparison and can be explained and sold only by an experienced sales agent. Historically, the insurance industry has relied on thousands of local insurance offices and agents to sell complex products uniquely suited to the circumstances of the insured person and the property. Complicating the insurance marketplace is the fact that the insurance industry is not federally regulated but, rather, is regulated by 50 different state insurance commissions that are strongly influenced by local insurance agents. Before a company can offer quotations on insurance, it must obtain a license to enter the insurance business in all the states where it provides quotation services or sells insurance.

Like the online mortgage industry, the online insurance industry has been very successful in attracting visitors who are looking to obtain prices and terms of insurance policies. Although many national insurance underwriting companies initially did not offer competitive products directly online because doing so might damage the business operations of their traditional, local agents, the websites and apps of almost all of the major firms now provide the ability to obtain a quote. There are also numerous online sites that provide comparative insurance quoting services, such as Insure.com, Insurance.com, Policygenius, Selectquote, QuickQuote, and NetQuote. Even if consumers do not actually purchase insurance policies online, the Internet has proven to have a powerful influence on consumer insurance decisions by dramatically reducing search costs and changing the price discovery process. Customers are also using multiple channels to research insurance. For instance, a recent survey found that more than 50% of consumers surveyed used social media to gather information on insurance companies and advisors. Over the years, the preference for purchasing insurance in-person compared to online has declined. Direct sales through insurers' websites or apps are making policy issuance seamless and instant, boosting customer satisfaction (LIMRA, 2022). All of the major U.S. insurers, such as GEICO, Allstate, State Farm, Progressive, and Travelers, have a significant online presence, both on the Web and via mobile apps that allow consumers to, in many instances, purchase insurance as well as file claims, make changes to their policy, and make payments.

The wave of interest in fintech companies previously discussed is also starting to filter into the insurance industry, with a subset labeled "insurtech" companies, who are seeking to use technologies such as big data, machine learning, and AI to disrupt the traditional insurance industry. For example, Lemonade, featured in the chapter-opening case, is attempting to reinvent the homeowners and renters insurance market by cutting out agents, offering competitive rates, and using a mobile app that features a chatbot and is powered by AI. Refer to the opening case for more information on Lemonade. Hippo, another example of insurtech, analyzes public data sets to develop an accurate profile of a customer's property, resulting in qualified customers receiving a comprehensive quote in less than 60 seconds. Hippo claims that its data-driven pricing algorithms reduce premium costs by up to 25% (Insider Intelligence/eMarketer, 2022l).

ONLINE REAL ESTATE SERVICES

During the early days of e-commerce, real estate seemed ripe for an Internet revolution that would rationalize this historically local, complex, and local agent–driven industry that monopolized the flow of consumer information. Potentially, the Internet and e-commerce might have disintermediated this huge marketspace, allowing buyers and sellers, as well as renters and owners, to transact directly; lowered search costs to near zero; and dramatically reduced prices. However, this did not happen. Thus far, the major impact of Internet real estate sites has been to influence offline decisions. The Internet has become a compelling method for real estate professionals, homebuilders, property managers and owners, and ancillary service providers to communicate with and provide information to consumers. According to the National Association of Realtors, the first step in the home buying process for nearly all ages of home buyers is to look online, with 50% searching on a desktop/laptop and 50% on a mobile device. At the same time, almost 90% still used the services of a real estate agent (National Association of Realtors, 2022). Some of the major online real estate companies include Realtor.com (owned by global media giant News Corp), Zillow and Trulia (both owned by the same company), Redfin, and Homes.com.

The primary service offered by online real estate companies is a listing of houses available. For instance, Realtor.com, the official website of the National Association of Realtors, lists millions of homes and has nearly 100 million monthly unique users across desktop and mobile devices. Listings typically feature detailed property descriptions, multiple photographs, and virtual 360-degree tours. Consumers can link to mortgage lenders, credit reporting agencies, house inspectors, and surveyors. There are also online loan calculators, appraisal reports, sales price histories by neighborhood, school district data, crime reports, and social and historical information on neighborhoods. Realtor.com uses machine learning and other AI tools to tailor both its online experience and its marketing. For instance, it has developed a tool that evaluates the relative importance of various home features to derive a "Match Score" for someone searching for a home. Realtor.com has also developed a machine learning module that enables users to find homes similar to the homes they are looking for and is using Match Score to personalize those recommendations. Other online firms using AI technologies include Zillow, with its Zestimate algorithm, which uses machine learning and neural network technology to analyze property data and generate an automated appraisal for a property (Kanaparathy and Kashyap, 2021; Gofus, 2022).

Although there has not yet been a revolution in the industry value chain, the fintech movement is beginning to affect the real estate industry as well. For instance, online real estate firm Opendoor purchases homes directly from sellers, enabling sellers to skip the step of hiring a real estate agent, and then sells the homes directly to buyers. In 2022, Zillow announced a partnership with Opendoor that allows home sellers on Zillow's platform to request an instant cash offer from Opendoor. Zillow views this partnership as another building block in Zillow's effort to develop a housing "super app" that connects all the fragmented pieces of the real estate process (Soper, 2022). Other startups, such as Qualia, are focused on creating a digital real estate closing platform. As a result of the pandemic, many states passed laws allowing remote, online notarization of documents, which underpins the ability to conduct a virtual closing (Bousquette, 2022).

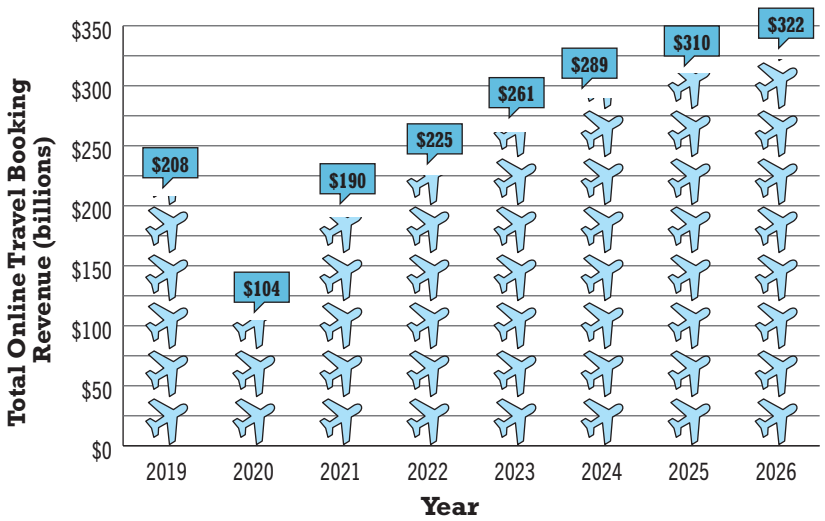
9.6 ONLINE TRAVEL SERVICES

Prior to the Covid-19 pandemic, online travel had been one of the most successful B2C e-commerce segments, accounting for almost 20% of all U.S. B2C e-commerce revenues in 2019. The Internet has now become the most common channel used by consumers to research travel options, seek the best possible prices, and book reservations for airline tickets, hotel rooms, rental cars, cruises, and tours. Today, more travel is booked online than offline. In 2019, more than 150 million people (about 67% of all U.S. Internet users) researched travel, and more than 125 million booked travel online. Online travel services revenues reached almost $210 billion in 2019. However, the travel industry was one of the most severely impacted by the Covid-19 pandemic, which disrupted travel around the world, and as a result, digital travel revenues dropped by 50% in 2020. However, travel began to resume in 2021, and in 2022, travel is expected to reach pre-pandemic levels, with expected online revenues of about $225 billion (see **Figure 9.5**) (Insider Intelligence/eMarketer, 2022m, 2022n).

WHY ARE ONLINE TRAVEL SERVICES SO POPULAR?

Online travel companies offer consumers a one-stop, convenient, leisure and business travel experience in which travelers can find content (descriptions of vacations and facilities), community (chat groups and bulletin boards), commerce (purchase of all travel elements), and customer service. Online travel companies offer much more information and many more travel options than traditional travel agents can.

FIGURE 9.5 U.S. ONLINE TRAVEL SERVICES REVENUES



U.S. online leisure/unmanaged business travel services revenues had been growing at a steady pace over the past five years but drastically declined in 2020 due to the Covid-19 pandemic. However, they resumed growing in 2021 and are expected to reach almost $325 billion by 2026.

SOURCE: Based on data from Insider Intelligence/eMarketer, 2022n.

For suppliers—airlines, hotels, and rental car companies—online travel service companies aggregate millions of consumers into singular, focused customer pools that can be efficiently reached through online advertising and promotions. Online travel companies create a much more efficient marketplace, bringing consumers and suppliers together in a low-transaction-cost environment.

Travel services are an ideal service for the Internet, and therefore e-commerce business models work well for this product. Travel is an information-intensive product requiring significant consumer research. It is a digital product in the sense that travel requirements—planning, researching, comparison shopping, reserving, and payment—can be accomplished for the most part online in a digital environment. On the travel reservation side, travel does not require any "inventory": There are no physical assets. And the suppliers of the product—airlines, hotels, rental cars, vacation excursions, and tour guides—are highly fragmented and often have excess capacity. Always looking for customers to fill empty airline seats, vacant rooms, and idle cars, suppliers are often willing to lower prices and advertise on websites that can attract millions of consumers. The online intermediaries—such as Expedia, Booking.com, and others—do not have to deploy thousands of travel agents in physical offices across the country but can instead concentrate on a single interface with a national consumer audience. Travel services do not require the kind of expensive, multi-channel, "physical presence" strategy required of financial services (although they generally operate centralized call centers to provide personal customer service). Therefore, travel services "scale" better.

THE ONLINE TRAVEL MARKET

There are four major sectors in the travel market: airline tickets, hotel reservations, car rentals, and travel packages. Airline tickets are the source of the greatest amount of revenue in online travel services. Airline reservations are largely a commodity. They can be easily described online. The same is true with car rentals: Most people can reliably rent a car over the phone or online and expect to obtain what they ordered. Although hotels are somewhat more difficult to describe online, hotel branding—supplemented by websites or apps that include descriptions, photographs, and virtual tours—typically provides enough information to most consumers to allow them to feel that they know what they are purchasing, making them comfortable enough to make hotel reservations online. Travel packages purchased online constitute the smallest percentage of travel sales.

corporate online booking solutions (COBS)
provide integrated airline, hotel, conference center, and auto rental services

Increasingly, corporations are outsourcing their travel service needs entirely to vendors who can provide online solutions, high-quality service, and lower costs. Online vendors to corporations provide **corporate online booking solutions (COBS)** that provide integrated airline, hotel, conference center, and auto rental services.

ONLINE TRAVEL INDUSTRY DYNAMICS

Because much of what online travel companies offer is a commodity, and thus they all face the same costs, competition among online providers is intense. Price competition is difficult because consumers can comparison-shop easily. Therefore, competition among companies tends to focus on scope of offerings, ease of use, payment options, and personalization. Some well-known online travel companies are listed in **Table 9.5**.

The online travel industry has been roiled by meta-search engines that scour the Web for the best prices on travel and lodging and then collect finder or affiliate fees

TABLE 9.5 MAJOR ONLINE TRAVEL COMPANIES

NAME	DESCRIPTION
LEISURE/UNMANAGED BUSINESS TRAVEL	
Expedia	Largest online travel service company; leisure focused. Owns Orbitz, Travelocity, CheapTickets, Hotels.com, HomeAway, Hotwire, and meta-search engine travel aggregator Trivago.
Booking Holdings	Formerly Priceline Group. Expedia's primary competitor. Owns Priceline, Booking.com, and meta-search engine travel aggregator Kayak. Leisure focused.
TripAdvisor	Online travel review company that also allows consumers to compare prices and book reservations.
MANAGED BUSINESS TRAVEL	
GetThere	Corporate online booking solution (COBS). Owned by Sabre Corporation.
BCD Travel	Full-service corporate travel agency.

for sending consumers to the lowest-price offerings. Online travel aggregators include Trivago, Kayak, Fly.com, and Mobissimo. These aggregators, in the eyes of many industry leaders, commoditize the online travel industry even further, cause excessive price competition, and divert revenues from the leading, branded firms who have made extensive investments in inventory and systems.

The online travel services industry has also gone through a period of intense consolidation. Expedia now owns Travelocity, Orbitz, CheapTickets, Hotels.com, Hotwire, HomeAway, and Trivago. Its primary competition consists of Booking Holdings, which owns Priceline, Booking.com, and Kayak. Together, Expedia and Booking Holdings control a whopping 95% of the U.S. online travel agency booking market. However, Google is also a player in this marketspace, with its Google Flights, which provides booking functionality. Financial services giant JPMorgan is reportedly building its own full-service, online travel business in an effort to control the entire buying experience for customers seeking to travel (Benoit, 2022).

Mobile devices and apps used for pre-trip planning, booking, check-in, and context- and location-based destination information are also transforming the online travel industry. For instance, in 2022, about 115 million people used a mobile device to research travel, and about 70 million actually booked travel using a mobile device, accounting for about 38% of all digital travel sales revenue. Smartphones are used much more frequently than tablets to both research and book travel (Insider Intelligence/eMarketer, 2022m, 2022n). All of the major airlines now have mobile apps to enable flight research, booking, and management. Mobile apps for hotels and car rental companies are also available from all of the major players such as Hertz and Avis for car rentals and from Marriott, Choice Hotels, Hilton, and Wyndham for hotels. Apps may sometimes target specific consumer behavior. For instance, mobile apps are very popular for booking at the last minute.

Social media is also having a big impact on the online travel industry. User-generated content and online reviews are having an increasing influence on travel-buying decisions (as well as on decisions about product purchases). The *Insight on Society* case, *Phony Reviews*, examines some of the issues that online reviews present for the travel industry.

INSIGHT ON SOCIETY

PHONY REVIEWS

People used to rely on travel agents for recommendations about travel destinations, hotels, and restaurants. Today, however, companies like TripAdvisor, Yelp, and Google have taken over that function. TripAdvisor has been a smashing success, with more than 1 billion user-generated reviews on nearly 8 million accommodations, restaurants, and other experiences; more than $900 million in revenue in 2021; and nearly half a billion monthly unique visitors to its platform worldwide. Yelp had 244 million reviews of restaurants and other services as of the end of 2021 and revenue of more than $1 billion. Google, of course, needs no introduction. Customer reviews of hotels, restaurants, and all other kinds of businesses are featured prominently on its search result pages. These companies have become trusted sources as people try to decide where to travel, what hotels to book, and where to eat. Research by the experience-management multinational Qualtrics XM revealed that more than 90% of people aged 18 to 34 trust online reviews as much as personal recommendations—and that a negative review can cost a business as much as 20% of its customer base. A good review can be worth thousands of dollars in bookings. But can all these reviews be trusted?

As a case in point, there is the infamous example of a British man named Oobah Butler who conducted an experiment that illustrated how easily online review sites can be manipulated. A former writer of phony reviews himself, Butler had the idea to use fake pictures of meals and phony reviews from his friends to portray the shed outside his house as an exclusive new restaurant. As buzz built around the nonexistent restaurant, which he had named The Shed at Dulwich, Butler had to turn down hundreds of eager would-be diners, and eventually the Shed became the top-rated restaurant in London without ever serving a single customer.

Although very few businesses on TripAdvisor, Yelp, Google, and other sites are fake like The Shed, many of the reviews on these platforms are fraudulent. Some businesses pay people to create false identities and post favorable reviews on these properties and to slam competing venues. For example, Which? Travel, a U.K.-based consumer group, analyzed about 250,000 TripAdvisor reviews for the 10 top-ranked hotels in 10 popular tourist destinations and found that about 15% were likely fake, claiming further that TripAdvisor was failing to take appropriate steps to address the issue.

Businesses can also tarnish their reputations by mishandling bad reviews, phony or otherwise. In the United States, a law prevents companies from suing customers that give an honest negative review of the business. Previously, some businesses had quietly altered their customer agreements to forbid negative customer reviews and give them legal recourse in the event of such reviews.

Although the authenticity of reviews is critically important to the success of Yelp and TripAdvisor, garnering a high review score is equally important to the businesses listed on the site. For instance, TripAdvisor research based on a sample of 9,000 consumers found that 75% considered online reviews "extremely or very important when making travel decisions." This gives businesses ample incentive to post phony reviews praising their own business and slamming their competitors.

Both Yelp and TripAdvisor use their own algorithms to automate the identification and removal of phony reviews. Yelp generates notices called Consumer Alerts to inform readers when a review is likely fraudulent and has introduced

a category of consumer alerts identifying businesses that have received reviews from review rings (reviewers that have been recruited and paid to post good reviews). Yelp also employs automated software that identifies and recommends what the platform views as the most reliable reviews. Yelp says that about 4.3 million of the approximately 19.6 million reviews contributed in 2021 were not recommended by its software, although it still displays those reviews.

TripAdvisor employs a team of 300 experts to analyze the integrity of reviews and has committed to issuing an annual Review Transparency Report. For instance, in its 2021 Transparency Report, TripAdvisor reported that in 2020, users had submitted more than 26 million reviews and that of these, 3.6% (around 950,000) were deemed to be fake, with 67% of the fake reviews blocked before they were ever posted, based on machine detection. Of course, that also implies that 33% of fake reviews slipped through and were detected only after they had appeared online. TripAdvisor's fraud investigators blocked paid review submissions from a total of 372 different paid review sites.

Nevertheless, these sites have plenty of incentive to downplay the extent of their phony review problems because customers are more apt to visit a business if it is highly rated and because the sites receive a commission any time it generates business for a restaurant, hotel, or other destination. TripAdvisor has been fined multiple times in the past by regulatory agencies for misrepresenting the authenticity of its reviews and even changed its slogan so that it no longer refers to trustworthy reviews. Critics believe that review sites exaggerate how effectively they can detect fraud, nothing that it's not hard to sidestep the systems. For instance, some fraudsters are using cloud-based AI software to overcome written-language deficiencies, as well as bots to generate copy.

Most investigations into fake reviews focus on the reviews' potential impact on consumers. However, the importance of positive reviews for businesses has left them ripe for potential exploitation by scammers. As a case in point, in July 2022, scammers launched a coordinated attack on independent restaurants across the country, leaving multiple one-star ratings on the restaurants' Google listings. The scammers then e-mailed restaurants to demand cash payments in exchange for deleting the reviews. An onslaught of bad reviews can be disastrous for a restaurant. Initially, Google was slow to respond, but eventually, after some publicity about the scam, most of the reviews have been removed. The experience reveals how easy it is for scammers to exploit a review system.

Despite all of the uncertainty surrounding phony and negative reviews, it might be true that TripAdvisor and Yelp are actually improving service at hotels and restaurants by providing valuable feedback on areas where a business can improve and increasing its incentive to do so. The vast majority of consumers seek out both negative and positive feedback from their prospective destinations, expecting the truth to be somewhere in between.

SOURCES: "Scammers Extorted Restaurants with One-Star Google Reviews. Is This the New Normal?," by Kristen Hawley, Bonappetit.com, July 26, 2022; "Restaurants Face an Extortion Threat: A Bad Review on Google," by Christina Morales, *New York Times*, July 11, 2022; "Inside the War on Fake Consumer Reviews," by Megan McClusky, Time.com, July 6, 2022; "Fast Facts," Yelp-press.com, June 30, 2022; "The Trusted Yelp 'Elite' Reviewers Who Sell Their Reviews for Cash," by Joseph Cox, Vice.com, April 26, 2022; "Yelp, Inc. Form 10-K for the Fiscal Year Ended December 31, 2021, Sec.gov, February 28, 2022; "TripAdvisor, Inc. Form 10-K for the Fiscal Year Ended December 31, 2021, Sec.gov, February 18, 2022; "We're All Hooked on Travel Reviews—But Can We Really Trust Them," by Chris Haslam, Thetimes.co.uk, February 11, 2022; "Yelp Cracks Down on 'Review Rings' as Google Continues to See Widespread Mapspam," by Greg Sterling, Searchengineland.com, January 10, 2020; "The Complicated, Problematic Influence of TripAdvisor Restaurant Reviews," by Diana Hubbell, December 5, 2019; "How TripAdvisor Changed Travel," by Linda Kinstler, *The Guardian*, August 17, 2018; "The Never-Ending War on Fake Reviews," by Simon Parkin, *The New Yorker*, May 31, 2018; "I Made My Shed the Top-Rated Restaurant on TripAdvisor," by Oobah Butler, Vice.com, December 6, 2017; "Consumer Review Fairness Act: What Businesses Need to Know," Ftc.gov, February 2017; "Companies Will No Longer Be Able to Fine You for Negative Online Reviews," by Bruce Brown, Digitaltrends.com, November 30, 2016; "Fake It Till You Make It: Reputation, Competition, and Yelp Review Fraud," by Michael Luca and Georgios Zervas, Harvard Business School, July 2015.

9.7 ONLINE JOB RECRUITMENT AND CAREER SERVICES

Traditionally, companies relied on a variety of employee recruitment tools: classified and print advertising, career expos (or trade shows), on-campus recruiting, private employment agencies (now called "staffing firms"), and internal referral programs. In comparison to online recruiting, these tools have severe limitations. Print advertising usually includes a per-word charge that limits the amount of detail employers provide about a job opening as well as a limited time period within which the job is posted. Career expos do not allow for pre-screening of attendees and are limited by the amount of time a recruiter can spend with each candidate. On-campus recruiting also restricts the number of candidates a recruiter can speak with during a normal visit and requires employers to visit numerous campuses. Staffing firms charge high fees and have a limited, usually local, selection of job hunters. And internal referral programs may encourage employees to propose unqualified candidates for openings in order to qualify for rewards or incentives.

Online job recruiting and career services overcome these limitations, providing a more efficient and cost-effective means of linking employers and potential employees while reducing the total time needed to hire qualified candidates. Online recruiting enables job hunters to more easily create, update, and distribute their résumés while gathering information about prospective employers and conducting job searches. Today, almost 90% of employers are using online services for recruitment, although they continue to use traditional methods as well (Monster, 2022).

The provision of online job recruitment and career services is dominated by three platforms: LinkedIn (see the opening case in Chapter 11), Monster, and CareerBuilder. Job listing aggregators, such as Indeed and SimplyHired, both owned by a Japanese-based human resources company, and Glassdoor, which also posts anonymous online reviews of companies by their employees, are also very popular.

Job recruitment is ideally suited for the Web. The hiring process is an information-intense business process that involves discovering the skills and salary requirements of individuals and matching those individuals with available jobs. In order to accomplish this matchup, there does not initially need to be face-to-face interaction or a great deal of personalization. Prior to the Internet, this information sharing was accomplished locally by human networks of friends, acquaintances, former employers, and relatives in addition to employment agencies that developed paper files on job hunters. The Internet can clearly automate this flow of information, reducing search time and costs for all parties.

Table 9.6 lists some of the most popular online job recruitment and career services platforms. Job hunters and employers have turned to these platforms because they save time and money for both parties. For employers, they expand the geographical reach of their searches, lower costs, and result in faster hiring decisions. According to recruiters, the most effective online job board tools include résumé search tools, applicant tracking systems, video interviewing functionality, the ability to distribute job ads on social media and other partner networks, and the ability to text or message candidates directly from the platform (Monster, 2022; Jobvite, 2021).

For job seekers, such platforms are popular not only because they enable job seekers to make their résumés widely available to recruiters but also because the platforms provide a variety of other related career services such as skills assessment, personality

TABLE 9.6 POPULAR ONLINE JOB RECRUITMENT AND CAREER SERVICES PLATFORMS

PLATFORM	BRIEF DESCRIPTION
GENERAL RECRUITMENT	
LinkedIn	Social network for professionals has become major player in online job recruitment and career services.
Monster	Launched in 1994, one of the first commercial online websites. Today, a public company offering general job searches in 50 countries.
CareerBuilder	Source for job opportunities and advice. Now primarily owned by Apollo Global Management, a private investor group.
Indeed	Job search engine/aggregator.
SimplyHired	Job search engine/aggregator.
Craigslist	Popular classified listing service focused on local recruiting.
Glassdoor	Best known for anonymous reviews of companies and management posted by current and former employees, but also has listings for millions of jobs.
EXECUTIVE SEARCH	
Korn Ferry	Low-end executive recruiting.
Spencerstuart	Middle-level executive recruiting.
ExecuNet	Senior-level executive search firm.
NICHE JOBS	
SnagAJob	Part-time and hourly jobs.
USAJobs	The federal government's official employment site.
HigherEdJobs	Education industry.
EngineerJobs	Engineering jobs.
Fiverr	Connects businesses with freelancers offering digital services in more than 500 job categories.
Showbizjobs	Entertainment industry.
Salesjobs	Sales and marketing.
Dice	Information technology.

assessment questionnaires, résumé-writing advice, software skills preparation, interviewing tips, personalized account management, job search tools, and employer blocking (which prevents your current employer from seeing that you have posted your résumé on the platform).

Perhaps one of the most important functions of online job board sites is not their capacity to actually match employers with job hunters as much as their ability to establish market prices and terms as well as trends in the labor market. Online job boards identify salary levels for both employers and job hunters and categorize the skill sets required to achieve those salary levels. In this sense, online job boards are online

national marketplaces that establish the terms of trade in labor markets. The existence of online national job boards should lead to a rationalization of wages, greater labor mobility, and higher efficiency in recruitment and operations because employers will be able to quickly find the people they need.

ONLINE JOB RECRUITMENT AND CAREER SERVICES INDUSTRY TRENDS

Trends for 2022–2023 in the online job recruitment and career services industry include the following:

- **Social recruiting:** LinkedIn has become the primary resource for job recruiting. Almost 60 million companies have a presence on the platform. According to LinkedIn, 50 million people use the platform each week to search for jobs, and more than 90% of recruiters search for candidates on LinkedIn. Employers are also using LinkedIn to conduct searches to find potential job candidates that may not be actively job hunting. For instance, LinkedIn Talent Solutions includes tools that help corporate recruiters find "passive talent" (people who are not actively looking for a new job) and that provide custom company profiles that are specifically designed for recruitment. According to LinkedIn, every minute, firms hire six people with whom they first made contact on the platform (LinkedIn, 2022). Social networks are also being used by employers to "check up on" the backgrounds of job candidates. According to a recent survey, about 67% of employers are using social networks to screen job candidates (other polls have found an even higher percentage of employers doing so), and 54% have rejected candidates because of content on a social network (Padova, 2022). Spelling and grammar errors in posts or tweets were the biggest negative factor, followed by references to drug or alcohol consumption, political posts, and posts containing inappropriate photos. However, on the flip side, recruiters also noted that not having any online presence also hurts candidates (LinkedIn, 2022; Padova, 2022; Jobvite, 2021).
- **Mobile:** As with other forms of services, job recruitment and career services firms have moved onto the mobile platform. According to a recent report, 67% of job applications in 2021 were completed on a mobile device, compared to 51% in 2019 (Appcast, 2022). To reach this audience, LinkedIn, CareerBuilder, Monster, and most of the other major platforms all have a mobile website as well as apps that allow job seekers to create and upload résumés; search jobs by keyword, location, and company; send e-mails to inquire about jobs; browse and apply for jobs; and more. LinkedIn's app, for instance, can recommend jobs based on data you provide on your profile page.
- **Video and remote recruiting:** The Covid-19 pandemic has accelerated a trend toward the use of remote recruiting via videoconferencing applications such as Zoom.
- **Job search engines/aggregators:** As with travel services, search engines that focus specifically on jobs are posing a threat to established online career sites. For instance, Indeed and SimplyHired "scrape" listings from thousands of online job sites such as Monster, CareerBuilder, specialty recruiting services, and the sites of individual employers to provide a free, searchable index of thousands of job listings in one spot. Because these firms do not charge employers a listing fee, they are currently using a pay-per-click or other advertising revenue model.

- **Data analytics, artificial intelligence, and algorithms:** Companies are increasingly using big data technologies in the hiring process, as well as AI techniques and adaptive algorithms that help them sift through online job applications and match job seekers to job openings. For instance, WorkLLama is an online platform that uses a conversational AI bot to connect job seekers with employers (Loten, 2022). However, the use of AI in the hiring process has given rise to concerns about possible embedded biases. In response, New York City has enacted a law, which comes into effect in January 2023, that will require companies to conduct audits to assess biases, including those along race and gender lines, in the AI systems they use in hiring (Vanderford, 2022).

9.8 ON-DEMAND SERVICE COMPANIES

On-demand service companies provide a platform that enables the on-demand delivery of various services by connecting providers ("sellers") who wish to exploit their "spare" resources, such as cars, rooms with beds, and the ability to perform various services via their personal labor, with consumers ("buyers") who would like to utilize those resources and services. Other common phrases sometimes used to describe these online businesses are "sharing economy," "collaborative commerce," "peer-to-peer consumption," "mesh economy," and "we-commerce." However, unlike traditional sharing, for which there is no fee charged in the transaction, these firms collect a fee for using their platforms from both sellers and/or buyers. In the last few years, hundreds of startups have created a plethora of such platforms, which allow owners of resources that are underutilized to sell access to those resources to consumers who would prefer not to, or who are unable to, buy those resources themselves.

A number of these on-demand service firms have grown exponentially over the last five years. **Table 9.7** lists just a few of the thousands of firms whose business model involves providing transaction platforms that enable the on-demand delivery of various services. See the *Insight on Business* case, *Food on Demand: Instacart and Grubhub*, for a look at two of these companies, both of which focus on the delivery of food on demand.

TABLE 9.7 EXAMPLES OF ON-DEMAND SERVICE FIRMS

FIRM	SERVICES ENABLED
Airbnb	Lodging
Uber	Transportation
Lyft	Transportation
TaskRabbit	Errand and household tasks
Instacart	Grocery shopping
Grubhub	Restaurant food delivery
DoorDash	Restaurant food delivery
Swimply	Private swimming pool rentals

INSIGHT ON BUSINESS

FOOD ON DEMAND: INSTACART AND GRUBHUB

When on-demand food delivery service companies were first founded, no one anticipated that a pandemic would transform them, at least for a time, into an essential service. Instacart, one of the leaders in on-demand grocery delivery, and Grubhub, one of the leaders in on-demand restaurant delivery service, are two companies whose business and revenues surged. At the same time, they, and other on-demand food delivery services like them, have come under fire for their treatment of their workforce and their profiteering at the expense of the businesses they serve.

Instacart was founded by Apoorva Mehta, who had previously been a supply chain engineer for Amazon. Instacart allows users to order groceries on the Web or via the Instacart app. Instacart then connects the user with a dedicated shopper who buys and delivers the groceries. Instacart is available in more than 5,500 cities.

The Instacart app allows shoppers to determine exactly where requested items are located using aisle navigation. It updates shoppers in real time when products are not available and provides highly customizable options to replace those products with products that are available at the grocery store selected by the customer. In-app chat allows shoppers to communicate directly with customers. A barcode-scanning feature allows shoppers to verify that they've chosen the correct items for customers. Instacart has also invested heavily in analytics, and the company claims that its delivery efficiency has improved, with the number of late deliveries dropping.

Instacart has multiple revenue sources. In addition to delivery fees, Instacart earns revenue from yearly subscription memberships, which provide unlimited deliveries. Instacart also generates advertising revenue from various brands, such as General Mills and Pepsi, and has revenue-sharing deals with grocery stores looking to improve their online delivery capabilities. It has partnered with more than 800 national, regional, and local grocery retail brands in North America, and its services are now available at more than 70,000 different stores. It has also launched a "Big & Bulky" service nationwide that focuses on the delivery of large items and has signed up retailers such as Office Depot, Container Store, and Staples for the service.

From 2016 through 2019, Instacart's share of online grocery sales steadily increased, more than doubling from 6.6% to 14.5%, even though it lost what had been its biggest client, Whole Foods, when Amazon purchased it in 2017. Then the pandemic struck. Instacart became the beneficiary of unprecedented demand from consumers seeking to use its service to obtain groceries without having to go to a physical store, and its share of online grocery sales increased to 21.5%. As a result, Instacart turned a profit for the first time in its history. Instacart hoped that the business momentum it developed during the pandemic would continue and that customers introduced to its service would keep using it even after the crisis passed, but those hopes have been somewhat scuttled. Although Instacart reportedly continues to operate at a profit, its growth has slowed as shoppers have returned to stores and become increasingly concerned about costs. More consumers are now opting for grocery pickup rather than delivery to avoid Instacart's delivery fees, gas surcharges, and the need to tip the Instacart shopper. However, despite the uncertain economic climate and the less-than-stellar financial results, Instacart is reportedly planning to go public before the end of 2022.

At the same time, Instacart continues to be plagued by controversy, most particularly

relating to its treatment of its shoppers/delivery workers. For instance, in September 2021, the Gig Workers Collective, an activist group representing 13,000 Instacart shoppers, urged customers to delete the app as a show of solidarity with workers advocating for better treatment. Although Instacart made some changes in response, this is likely to be a continuing issue.

Grubhub is another company that reported record revenues during the pandemic. Grubhub is one of the most prominent companies in the United States in the on-demand restaurant food delivery market. Using the Grubhub app, users can type in their address and see a map of all of the local restaurants that deliver in the area as well as restaurants that offer food pickup. Filters allow app users to narrow options by restaurant name, menu item, or style of cuisine, and users can order by phone or online. Grubhub also offers special deals, reviews, and other perks for diners. For restaurants that aren't big enough to have their own mobile app, partnering with Grubhub is a great way to increase their exposure and bring in customers that are mobile users. Grubhub currently works with more than 320,000 restaurants in more than 4,000 cities.

Grubhub was founded in 2004 and went public in 2014. Its revenues and number of active diners grew rapidly, with revenues increasing from just $360 million in 2015 to more than $1.8 billion in 2020 and the number of active diners increasing from 6.7 million in 2015 to more than 31 million in 2021. The company bolstered its ability to deliver food via acquisitions, merging with Seamless, a primary competitor, as well as acquiring a number of other competitors.

Like Instacart, Grubhub has been dogged by controversy throughout its history. It faces continuing trouble over its classification of drivers as independent contractors rather than actual employees. In 2019, it was discovered that Grubhub was buying up thousands of domain names that correlated with the names of restaurants that use its service and, in some instances, creating websites that looked like they belonged to the restaurant but instead linked to Grubhub. Restaurants had already been complaining that services such as Grubhub were siphoning off much-needed revenue, with fees ranging from 15% to 40% of an order, and during the pandemic, critics charged Grubhub and other restaurant delivery services with profiting at the expense of restaurants struggling to survive. The Washington D.C. Attorney General has filed a lawsuit against Grubhub for charging hidden fees and using deceptive marketing tactics during the pandemic to boost its profits at the expense of consumers and restaurants.

In June 2021, Just Eat Takeaway, a European company, acquired Grubhub for $7.3 billion. However, less than a year later, it was reportedly exploring a sale of Grubhub. In 2022, growth has slowed for nearly all food delivery companies, and Grubhub continues to face stiff competition in the United States from market leader DoorDash as well as from UberEats and Postmates. These market conditions are leading investors to reassess their previous valuation of food delivery companies.

SOURCES: "Will Instacart Keep Eating up Grocery Share?," by Sara Lebow, Insider Intellgience/eMarketer, August 30, 2022; "Instacart Launches a 'Big & Bulky' Service," by Zak Stambor, Insider Intellience/eMarketer, August 25, 2022; "Instacart Aims to Go Public before Year's End, Defying a Frozen IPO Market," by Berber Jin et al., *Wall Street Journal*, July 28, 2022; "Grocery Shoppers Turn to Delivery in a Bid to Cut Costs," by Rachel Wolff, Insider Intelligence/eMarketer, June 16, 2022; "Why Just Eat May Sell Gruhub Less than a Year after Spending $7.3 Billion," by Zak Stambor, Insider Intelligence/eMarketer, April 20, 2022; "D.C. Sues Grubhub, Alleging It Took Advantage of Suffering Restaurants," by Tiim Carman, *Washington Post*, March 24, 2022; "Instacart Shopper Activist Group Asks Customers to Delete the App Until Demands for Better Conditions Are Met," by Amanda Silberling, Techcrunch.com, September 21, 2021; "Grubhub, Inc. Form 10-K for the Fiscal Year Ended December 31, 2020, Sec.gov, February 26, 2021; "As Diners Flock to Delivery Apps, Restaurants Fear for Their Future," by Nathaniel Popper, *New York Times*, June 9, 2020; "Grubhub Collected Record Fees from Restaurants Struggling to Stay Alive during the Pandemic," by Venessa Wong, Buzzfeednews.com, May 7, 2020; "Report: Coronavirus Grocery Delivery Demand Has Made Instacart Profitable for the First Time," by Kris Holt, Forbes.com, April 27, 2020; ""Instacart Finds Online Grocery Success beyond Whole Foods," by Matt Pace, Digitalcommerce360.com, October 22, 2019; "Grubhub Is Buying Up Thousands of Web Addresses. That Means Mom and Pop Can't Own Their Slice of the Internet," by H. Claire Brown, Thecounter.org, June 28, 2019; "How Grubhub Analyzed 4,000 Dishes to Predict Your Next Order," by Adam Rogers, Wired.com, April 2, 2018.

Collaborative commerce, trading platforms, and peer-to-peer (P2P) commerce are not new. For example, eBay, one of the pioneers of e-commerce, enables the P2P sale of items at auction or for fixed prices. What is new about on-demand services firms is their use of mobile and Internet technology to enable transactions involving personal services and personal resources that traditionally have not been available on a large scale. This is especially true of the car and lodging services, for which transactions are local and mobile. Second, the growth of these firms is supported by the use of online reputation systems based on peer review to establish a trusted environment where sellers and consumers can feel confident transacting with one another. Online peer review of both the providers and the consumers helps to ensure that both parties have acceptable reputations and that a high quality of service is provided. These firms have learned from eBay and Netflix the importance of peer reviews and ratings. A third factor is that successful firms lower the costs of services like urban transportation, lodging, office space, and personal errand services. Firms that can do so are highly disruptive of existing firms and business models.

Uber and Airbnb are among the most well-known on-demand service companies. See the case study at the end of Chapter 1 for a description of Uber and an in-depth discussion of the issues that this business model raises. Airbnb was founded in 2008 as a way for attendees at a business convention to find lodging. Since then, Airbnb has expanded to the entire lodging marketplace and has grown exponentially, going public in December 2020 with a valuation of $47 billion. Airbnb now operates in more than 100,000 cities in 220 countries around the world. More than 4 million people with space to rent ("hosts") have signed up. Currently, more than 6 million different properties, ranging from apartments to homes to luxury villas and even castles and Mongolian yurts, are available on the platform. (In May 2022, Airbnb introduced a major site-wide redesign to make it even easier to find offbeat and niche properties.). Since its founding, Airbnb has grown to be larger than Marriott International, the world's largest private hotel chain, which, in comparison, has around 5,700 hotels and about 1.1 million rooms from 20 different brands around the world. Hosts create an account and a profile and then list their properties. The host determines the amount charged, which is usually based on the host's assessment of similar listings nearby and market demand. Travelers seeking to rent spaces register and create an account, which includes a profile. They then consult the website/app listings, read reviews of the host, and contact the host through Airbnb to arrange for the rental. After the rental period, hosts rate their renters, and vice versa. Renters pay through their Airbnb account, which must be funded by a credit card. Airbnb charges guests a sliding fee of 6% to 12%, depending on the price of the booking, and charges the host 3%. The hosts are issued an IRS 1099 form at the end of the year to report taxes due on the income.

Uber and Airbnb stand out not only as among the most well-known on-demand service firms but also as among the most disruptive and controversial. For instance, property renters with Airbnb do not have the regulatory or tax burdens that hotel owners have. It is possible that the success of Airbnb could reduce the demand for regulated hotels. There is little research on this topic, but an early paper found that Airbnb had a small impact on rental income at lower-end tourist hotels but little empirical impact on business traveler hotels (Zervas et al., 2015). The possibility of negative outcomes from

transactions (for example, an apartment being destroyed by renters) has led Airbnb to offer hosts $1 million in liability insurance for free. Like Uber, Airbnb faces significant legal challenges. For example, a number of countries and cities had enacted legislation regulating short-term rentals such as those facilitated by Airbnb. In New York City, for instance, Airbnb continues to be hampered by a law that prohibits homes and apartments from being rented out for less than 30 days, unless the host is actually present during the guest's stay. Another New York City law imposes fines on Airbnb hosts who advertise listings that violate this law. In Boston, regulations that took effect in December 2019 require hosts to own their properties and live in them for at least nine months of the year. Airbnb is facing similar battles in other countries, such as Holland, Germany, and Spain. Regulations such as these may have a negative impact on Airbnb's business (Airbnb, Inc., 2022; Kingson, 2022; Carville, Tartar, and Lin, 2020; Feuer, 2019).

9.9 CAREERS IN E-COMMERCE

This chapter provides you with an overview of how e-commerce is being used today in the retail and services industries. Traditional retailers are turning to omnichannel strategies by investing heavily in new websites, mobile apps, and social media; encouraging in-store shopping and online buying; and offering same-day, local pickup of online orders. As a result, there are an increasing number of jobs involved in retail e-commerce.

THE COMPANY

The company is a luxury fashion retailer and department store that operates more than 260 stores throughout the United States and Canada. The company sells apparel, shoes, jewelry, handbags, and home furnishings. The firm also has several websites, including a clearance website, a focused luxury website for designer fashions, as well as a mobile app and Facebook, Instagram, and Pinterest presences. Although sales at its stores have languished along with other retailers', its online sales are growing at 10% annually and currently account for about 20% of its retail sales. The company is planning a major expansion of its online digital operations to compete with online-only retailers and is developing a more robust omnichannel presence.

POSITION: ASSOCIATE, E-COMMERCE INITIATIVES

You will be working on the E-commerce Initiatives Team with a number of internal departments to ensure the delivery of an effective online customer experience and to increase e-commerce revenues. Responsibilities include:

- Gathering and analyzing online data and making recommendations to adjust strategies and programs to further improve the customer experience and sales.
- Recommending and managing the development of supplemental website content/sections.
- Advocating for best practices and new industry trends and opportunities for increased web sales and online branding.

- Working with internal teams to identify and implement commerce-related opportunities.
- Analyzing consumer journeys.
- Working with website designers to enhance the customer experience and optimize the digital platforms to push customers through the sales funnel, drive conversion, and increase the number of repeat visitors.
- Supporting the business by using qualitative and quantitative analytical insights to help drive on-site optimization.
- Leveraging website analytics to support customer experience optimization, including but not limited to product page, navigation, and search engine optimization/search engine marketing (SEO/SEM) across various digital platforms.
- Collaborating with the e-commerce and marketing teams to identify opportunities involving mobile and social network features such as recommendations, reviews, and algorithms.

QUALIFICATIONS/SKILLS

- Bachelor's degree in business or marketing with course work in e-commerce, statistics, and information systems
- Experience or knowledge of online consumer marketing strategies
- Knowledge of social and mobile marketing tools
- Understanding of site navigation, consumer pathways, and user-interface design
- Knowledge of website reporting tools and the metrics of e-commerce performance
- Ability to work well across multiple departments and independently
- Excellent analytical skills and problem-solving ability
- Strong planning and organizational skills
- Excellent written and verbal communication
- Strong team player and leadership qualities

PREPARING FOR THE INTERVIEW

Do background research on the firm and the industry in which it operates. How does it compare to competitors? Review Section 9.1 so that you can demonstrate some basic knowledge of strategic and financial analysis. Read Section 9.2, with a particular focus on the sections that discuss omnichannel retail, as well as Section 9.3. In addition, it would be worthwhile to closely review the *E-commerce in Action* case on Amazon, as understanding Amazon and the impact it has is imperative for anyone working in online retail. Next, review the closing case study on Blue Nile. Finally, re-read the *Insight on Business* case in Chapter 6 on marketing to the luxury audience ("*Are the Very Rich Different from You and Me*?") to understand the success factors and challenges of online marketing to an affluent audience. Do background research on the luxury goods marketplace and on marketing to the affluent.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. Why do you think sites like Amazon have been so successful with consumers?

Here, you could draw on the information that you have learned about Amazon from the *E-commerce in Action* case study in the chapter as well as from your own experience using Amazon. Amazon stands out for its product search engine prowess and its easy journey for consumers from search to purchase. Amazon Prime's "free" two-day delivery and very liberal return policies are also critical to Amazon's success.

2. We're planning on developing a powerful omnichannel capability that would allow consumers to combine online and in-store shopping and purchasing and would include same-day pickups at our stores. What do you think are the key success factors for these efforts? What are some of the challenges?

Here, you can draw on information you have learned from the chapter (particularly Table 9.3) as well as your own experience with omnichannel retail firms such as Walmart, Target, Costco, or others. Some keys to success are consistent branding of stores and websites, in-store kiosks for consumers to view inventory in the local store or online, and local store employees who have been re-trained as pickers for online orders and local pickups by consumers.

3. How can we best use social networks and mobile platforms to drive sales?

Selling luxury goods online involves creating impressive images that reflect the brands and products being sold to a very upscale audience. Visual platforms such as Instagram and Pinterest are ideal.

4. Our focus is on luxury products that are differentiated from other mass market retailers, both online and offline. How should this focus influence our m-commerce efforts?

The display space available on mobile screens is very limited, so the emphasis should be on photos and design images that can be clicked on to take mobile users to either a website or a more complete collection of photos and descriptions of apparel and accessories.

5. What experience have you had developing website content?

You can talk here about your experience developing any kind of blog or website content, including photos, videos, and text. Be sure to mention what worked, what did not, and what you learned from the experience. You can also describe what you find to be really impressive website content and also what you find to be really unattractive website content.

9.10 CASE STUDY

Blue Nile Sparkles
for Your Cleopatra

Looking for that special gift for your Cleopatra but don't want to spend a lot of time shopping? Want to give the "Big Rock" without spending a mountain of cash for the engagement experience? Not sure about the future value of diamonds? What about the setting? Should you get gold or platinum?

Blue Nile is one answer for these questions and concerns. Blue Nile offers an online selection of handcrafted rings and more than 650,000 loose diamonds. You can buy them cut and polished or put them into settings like rings, bracelets, earrings, necklaces, pendants, watches, and brooches that you choose online. All the diamonds are graded by the four Cs—carats (size), cut, color, and clarity—and a report for each diamond prepared by the Gemological Institute of America is available online.

BlueNile.com started out as RockShop.com in March 1999 in Seattle, Washington, and changed its name to Blue Nile and launched a Blue Nile website later that year. In 2004, it went public. In 2007, Blue Nile sold the most expensive item in Internet history at the time, a $1.5 million single diamond of around 10 carats, a size that would cover your finger with a penny-size rock. In 2015, another diamond sold for $1.8 million.

Back in the early days of e-commerce, no one ever thought that the Internet would be a place where fine jewelry could be sold. Shopping online hardly matches the emotional impact of walking into Tiffany's or another established retail jewelry store with clear glass cases filled with brilliantly shining baubles and attended by a small army of salesclerks who make you feel like royalty. Diamonds represent a significant cost and are associated with significant events like engagements and anniversaries, but there is often uncertainty about their value and pricing. Surveys show that most shoppers believe jewelry is highly overpriced, but shoppers lack the information to negotiate a

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better price or even to judge the quality of what they are buying. Most experts thought that few consumers would feel comfortable going to a website and plunking down $5,000 or more for a diamond they could not see or touch for several days. But as it turns out, the retail jewelry industry is an ideal candidate for online sales.

The $60 billion fine jewelry industry in the United States is a byzantine, fragmented collection of more than 20,000 specialty jewelry stores and another 100,000-plus that sell jewelry along with other products. Diamond jewelry and loose diamonds together constitute more than 50% of retailers' sales. Several layers of wholesalers and middlemen, from rough diamond brokers to diamond cutters, diamond wholesalers, jewelry manufacturers, jewelry wholesalers, and, finally, regional distributors, serve this market. The fragmented supply and distribution chains add to huge markups based on monopoly-set prices for raw diamonds. The typical retail jewelry store markup for diamonds is between 50% and 100%. Blue Nile's markup is much less, and its prices tend to run 25% to 50% below those of traditional jewelry store retailers.

Blue Nile has simplified the supply side of diamonds by cutting out several layers of intermediaries and instead dealing directly with wholesale diamond owners and jewelry manufacturers. Blue Nile also minimizes its inventory costs and limits its risk of inventory markdowns. Instead of expensive physical stores, Blue Nile offers a website and an app at which it can aggregate the demand of thousands of unique visitors for diamonds and present them with a more attractive shopping experience than a typical retail store can. The result of rationalizing the supply and distribution chain is much lower markups. For example, Blue Nile will purchase a pair of oval emerald and diamond earrings from a supplier for $850 and charge the consumer about $1,000. A traditional retailer would charge the consumer $1,258.

Blue Nile has improved the shopping experience primarily by creating a trust- and knowledge-based environment that reduces consumer anxiety about the value of diamonds. Blue Nile's website and app contain educational guides to diamonds and diamond-grading systems, and each diamond receives an independent quality rating from a nonprofit industry association. There's a price-match guarantee as well as a 30-day, money-back, no-questions-asked return policy; a lifetime warranty; and a buy-back program that allows customers to receive full value for diamond jewelry previously purchased when exchanged for a more expensive diamond. The average customer visits the website repeatedly over several weeks, views at least 200 pages, and typically calls Blue Nile's live customer service line at least once before making a purchase.

In 2010, Blue Nile introduced a mobile website and an iPhone/iPad app. The iPhone app provides users with a quick way to set specifications for a diamond and see the price as well as a Call button that provides a direct link to the Blue Nile call center for phone orders. Blue Nile has also dived into social media marketing, with a Facebook page that has around 1.9 million followers, a YouTube channel with almost 13 million views, a Pinterest page, an Instagram feed, and a Twitter account. Users attracted to a posted image of a piece of jewelry can click links that take them directly to a purchase page for the item.

To support its customer-focused experience, Blue Nile also adopted an integrated suite of applications based on Oracle Cloud. For instance, Oracle Responsys, part of the Oracle Customer Experience (CX) application, enables Blue Nile to handle each customer interaction across all its channels, including its website, call center, and showroom, in a more personalized and timely manner. The system enables Blue Nile to examine the

browsing and buying habits of site visitors and tailor unique offers and messages to people based on their activity at the site. According to Blue Nile, customers on average "touch" Blue Nile on its website or apps, in showrooms, or on social media about 20 times before buying a piece of jewelry. A different part of the Oracle Cloud suite, Oracle Enterprise Performance Management (EPM) Cloud, helps Blue Nile make its planning and budgeting process more efficient by seamlessly integrating data and processes with Blue Nile's core enterprise resource planning and operational systems.

Blue Nile has moved toward branded jewelry and higher price points and away from simply offering the lowest prices. It has begun offering a proprietary line of high-end jewelry and has also revamped its packaging from plain cardboard boxes to fully customized packaging with a jewelry pouch, a custom-sized ring box, and packaging for marketing materials, similar to that offered by luxury jewelers such as Tiffany's. In addition, Blue Nile has focused on ethically sourced, conflict-free diamonds (see the *Insight on Technology* case in Chapter 12 on the use of blockchain to track diamonds in the diamond supply chain).

In 2013, Blue Nile entered into a partnership with Nordstrom that allowed prospective Blue Nile customers to see rings before they bought them online. Rings in the Nordstrom outlets were for display only, but Nordstrom jewelry experts used iPads to help customers purchase rings that appealed to them from the Blue Nile site while in the Nordstrom store. The response was very positive.

Buoyed by this success, Blue Nile opened its first physical showroom in 2015. The showroom allows customers to see and try on products before purchasing them online. Most of the showrooms are relatively small and do not provide for in-store sales, so customers still need to make any actual purchases online. This allows Blue Nile to offer many of the services that bricks-and-mortar jewelers can provide without forcing Blue Nile to raise its prices to account for inventory management and a large sales force. After experiencing significant upticks in online sales in the region around its first showroom, Blue Nile has since added 18 more. The showrooms serve several purposes. They act as distribution hubs and as staging areas for shipping, pickup, and on-demand local delivery for orders placed online. They also give Blue Nile's customers an opportunity to interact with its personnel and products firsthand, providing customers with the chance to consult face-to-face with jewelry experts who can explain options and how diamonds are priced. The showrooms, coupled with Blue Nile's website and mobile app, provide multi-touch integration in a low-pressure learning environment. The showrooms also provide customers with a place to go for jewelry repairs and cleaning. Marketing is another important function of the showrooms. The showrooms raise brand awareness and increase consumer confidence. Showrooms not only provide a higher closing rate and increase the average order size compared to website-alone orders but also increase overall sales within the geographic area by 80%. Blue Nile also offers virtual appointments with a personal jeweler in a virtual showroom that are designed to feel very similar to an in-person experience. The virtual showroom features a professional studio with multiple cameras and enables the personal jeweler to present carefully selected items for customers to view online and discuss.

In 2017, Blue Nile was purchased by private investors for more than $500 million. Although the company had posted consistent profits, which many other companies in online retailing struggle to do, it had not grown as quickly as investors in the stock market

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typically want to see. In 2019, Blue Nile named Sean Kell as its new chief executive officer and charged him with the task of elevating Blue Nile's customer-focused approach. In mid-2022, Blue Nile announced plans to once again go public in a transaction that valued the company at about $875 million. Blue Nile reported that since 2018, it had generated a 17% compound annual growth rate, that it had generated $566 million in revenue in 2021, and that it expected to reach from $661 million to $773 million in revenue in 2023. Blue Nile stated that it believed it had only scratched the surface of not only the $60 billion U.S. fine jewelry market but also the $320 billion global market, into which it planned to continue to expand beyond the 44 countries it was currently shipping to.

However, in the face of an uncertain economic climate and stock market, Blue Nile ultimately decided to go a different route. In August 2022, it announced that instead of going public, it would be acquired by Signet Jewelers, the owner of Kay, Zales, and Jared, respectively the first-, third-, and fourth-largest specialty retail jewelry brands in the United States. Signet also owns JamesAllen.com, an online jewelry retailer that competes directly with Blue Nile. Blue Nile is an attractive acquisition for Signet, enabling Signet to grow its diamond business by increasing its appeal to the younger, socially conscious, more affluent, and ethnically diverse consumers that make up the majority of Blue Nile's customer base. For Blue Nile, joining Signet enables it to extend its brand and jewelry offerings to millions of new customers while also being able to leverage Signet's technology infrastructure to bring new capabilities to Blue Nile's e-commerce business.

Jckonline.com, February 16, 2017; "Blue Nile Purchased by Bain Capital," by Rob Bates, Jckonline.com, January 31, 2017; "How Blue Nile Delivered a Million Pieces of Bridal Jewelry," by Anthony DeMarco, Forbes.com, October 26, 2016; "Leading Jewelry E-retailer Blue Nile Opens Its First Physical Showroom," by Matt Lindner, Internetretailer.com, June 5, 2015; "As Smartphones Spread, Retailers Scramble to Ring Up Sales," by Angel Gonzalez, *Seattle Times*, April 12, 2014; "Blue Nile CEO Says Click-and-Brick Jewelry Experiment with Nordstrom Is Working Well," by John Cook, Geekwire.com, March 26, 2014; "Selling Information, Not Diamonds," by Kaihan Krippendorf, Fastcompany.com, September 1, 2010; " "Digital Bling: Diamonds for Sale Online," by Wendy Kaufman, NPR.org, February 14, 2010; "New Blue Nile Site Hits Web," *New York Times*, September 1, 2009.

Case Study Questions

1. How has Blue Nile reduced consumer anxiety about purchasing diamonds online?
2. How and why has Blue Nile evolved from being an online-only retailer?
3. Why did Signet Jewelers purchase Blue Nile?

9.11 REVIEW

KEY CONCEPTS

■ Explain how to analyze the economic viability of an online firm.

- The economic viability of a firm, or its ability to survive during a specified time period, can be analyzed by examining the key industry strategic factors, the strategic factors that pertain specifically to the firm, and the financial statements of the firm.
- The key industry strategic factors include barriers to entry, the power of suppliers, the power of customers, the existence of substitute products, the industry value chain, and the nature of intra-industry competition.
- The key firm strategic factors include the firm value chain, core competencies, and synergies; the firm's current technology; and the social and legal challenges facing the firm.
- The key financial factors include revenues, cost of sales, gross margin, operating expenses, operating margin, net margin, and the firm's balance sheet.

■ Understand the environment in which the online retail sector operates today.

- Personal consumption of retail goods accounts for about 24% of total gross domestic product (GDP).
- The retail industry can be divided into seven major firm types: general merchandise, durable goods, specialty stores, food and beverage, gasoline and fuel, mail order/telephone order (MOTO), and online retail firms. Each type offers opportunities for online retail.
- During the early days of e-commerce, some predicted that the retail industry would be revolutionized because of reduced search costs, lower market entry costs, the replacement of physical store merchants by online companies, the elimination of middlemen (disintermediation), and hypermediation. Today, it has become clear that few of the initial assumptions about the future of online retail were correct. The reality is that:
  - Online consumers are not primarily cost-driven—instead, they are as brand-driven and influenced by perceived value as their offline counterparts.
  - Online market entry costs were underestimated, as was the cost of acquiring new customers.
  - Older, traditional firms have not disappeared and are reinventing themselves as omnichannel retailers.
  - Disintermediation did not occur. On the contrary, online retailing has become an example of the powerful role that intermediaries play in retail trade.
- Although the online retail sector is still one of the smallest segments of the retail industry, it is growing at the fastest rate of all retail industry segments, and more consumers than ever are shopping online. Computers and consumer electronics, apparel and accessories, and furniture and home furnishings are the top-three online categories in terms of the amount of revenues generated.
- Apart from Amazon (the leader by far), eBay, Wayfair, and a few other online-only firms, the top online retail firms in terms of online sales are primarily omnichannel firms, such as Walmart and Target, that have established brand names and for whom e-commerce still plays a relatively small role when compared to their offline physical store channels. The continuing extraordinary growth in m-commerce, social e-commerce, and local e-commerce is another important aspect of online retail today, as is the increased use by retailers of big data and artificial intelligence.

■ Identify the primary types of online retailers, and understand the different challenges each type faces.

- *Virtual merchants* are e-commerce firms that generate almost all of their revenues from online sales. Their challenges include building a business and a brand name quickly, dealing with many competitors in the virtual marketplace, having substantial costs to build and maintain an e-commerce presence, having considerable marketing expenses, having large customer acquisition costs, facing a steep learning curve, and needing to quickly achieve operating efficiencies in order to preserve a profit. Amazon is the most-well-known example of a virtual merchant.
- *Omnichannel merchants* (bricks-and-clicks) have a network of physical stores as their primary retail channel, but they also have online operations. Their challenges include high costs of physical buildings, high costs of large sales staffs, the need to coordinate prices across channels, the need to develop methods of handling cross-channel returns from multiple locations, and the needs to build a credible e-commerce presence; hire new, skilled staff; and build rapid-response order entry and fulfillment systems. Macy's is an example of a bricks-and-clicks company.
- *Manufacturer-direct merchants* (also sometimes referred to as DTC or D2C [direct-to-consumer]) are either single- or multi-channel manufacturers who sell to consumers directly online without the intervention of physical retailers. Their challenges include channel conflict; quickly developing a rapid-response online order and fulfillment system; switching from a supply-push (products are made prior to orders being received based on estimated demand) to a demand-pull model (products are not built until an order is received); and creating sales, service, and support operations online. Dell is an example of a manufacturer-direct merchant.

- *Catalog merchants* are established companies that have a national, offline catalog operation as their largest retail channel but that also have online capabilities. Their challenges include high costs for printing and mailing, the need to leverage their existing assets and competencies to the new technology environment, and the needs to develop methods of handling cross-channel returns, of building an e-commerce presence, and of hiring new, skilled staff. Lands' End is an example of a catalog merchant.

Describe the major features of the offline and online service sectors.

- The service sector is the largest and most rapidly expanding part of the economy in the United States.
- Major service industry groups include financial services (including insurance and real estate), travel, business and professional services, and health and education services. Within these groups, companies can be further categorized into those that involve transaction brokering and those that involve providing a "hands-on" service.
- With some exceptions, the service sector is by and large a knowledge- and information-intense industry. For this reason, many services are uniquely suited to e-commerce and the strengths of the Internet.
- E-commerce offers extraordinary opportunities to improve transaction efficiencies and thus productivity in a sector where productivity has so far not been markedly affected by the explosion in information technology.

Discuss the trends taking place in the online financial services industry today.

- The online financial services sector is a good example of an e-commerce success story, but the success is somewhat different than what had been predicted in the early days of e-commerce. Today, multi-channel, established financial firms have, in many instances, taken over many of the early online innovators. However, increasing investment in "fintech" startup companies in the financial services industries is bringing a new wave of innovation.
- Online banking (particularly mobile banking) and online brokerage (stock trading) have now become commonplace.
- Despite a rocky start, the online mortgage market is slowly growing; it is dominated by established online banks and other online financial services firms, traditional mortgage vendors, and a few successful online mortgage firms.
- Term life insurance stands out as one product group supporting the early visions of lower search costs, increased price transparency, and the resulting consumer savings. However, in other insurance product lines, the Web offers insurance companies new opportunities for product and service differentiation and price discrimination.
- The early vision that the historically local, complex, and agent-driven real estate industry would be transformed into a disintermediated marketplace where buyers and sellers could transact directly has not been realized. The major impact of the online real estate industry is in influencing offline purchases, and the primary service is a listing of available houses, with secondary links to mortgage lenders, credit reporting agencies, neighborhood information, loan calculators, appraisal reports, sales price histories by neighborhood, school district data, and crime reports.

Describe the major trends in the online travel services industry today.

- The Internet has become the most common channel used by consumers to research travel options and book reservations for airline tickets, rental cars, hotel rooms, and tours. However, online travel services were severely impacted by the Covid-19 pandemic and are just now returning to pre-pandemic levels.
- The major trends in online travel services include consolidation, the rise of meta-search engines, mobile devices, and social media.

■ Identify the current trends in the online job recruitment and career services industry.

- Next to travel services, online job recruitment and career services have been one of the Internet's most successful online services because they save money for both job hunters and employers.
- Online recruiting can also serve to establish market prices and terms, thereby identifying both the salary levels for specific jobs and the skill sets required to achieve those salary levels.
- The major trends in the online career services industry are social recruiting; mobile, video and remote recruiting; job search engines/aggregators; and the use of data analytics, artificial intelligence, and algorithms.

■ Understand the business models of on-demand service companies.

- On-demand service companies provide a platform that enables the on-demand delivery of various services by connecting providers ("sellers") who wish to exploit their "spare" resources, such as cars, rooms with beds, and ability to perform various services via their personal labor, with consumers ("buyers") who would like to utilize those resources and services. The companies collect a fee from both sellers and buyers for using the platform.
- Uber, a car rental service, and Airbnb, a room rental service, are the most well-known, but there are now thousands of firms whose business model is to provide transaction platforms that enable the online delivery of various services. These firms are also among the most disruptive and controversial.

QUESTIONS

1. Why were so many entrepreneurs initially drawn to start businesses in the online retail sector?
2. What frequently makes the difference between profitable and unprofitable online businesses today?
3. What is BOPIS? How has it impacted local e-commerce?
4. What are some of the advantages that online retailers have?
5. Name two assumptions that e-commerce analysts made early on about consumers and their buying behavior that turned out to be false.
6. Explain the distinction between disintermediation and hypermediation as it relates to online retailing.
7. Compare and contrast virtual merchants and omnichannel (bricks-and-clicks) merchants.
8. What is the difference between a supply-push sales model and a demand-pull sales model? Why do most manufacturer-direct firms have difficulty switching from the former to the latter?
9. What are five strategic issues specifically related to a firm's capabilities? How are they different from industry-related strategic issues?
10. Which is the best measure of a firm's financial health: revenues, gross margin, or net margin? Why?
11. What are some of the difficulties in providing services in an online environment? What factors differentiate the services sector from the retail sector, for example?
12. Compare and contrast the two major types of online services industries. What two major features differentiate services from other industries?
13. What is the biggest deterrent to the growth of the online insurance industry nationally?
14. Define channel conflict, and explain how it applies to the retail industry.
15. What is the most common use of real estate websites? What do most consumers do when they go to them?
16. How have travel services suppliers benefited from consumer use of online travel services providers?
17. Name and describe five traditional recruitment tools that companies have used to identify and attract employees. What are the disadvantages of such tools compared to online job recruitment and career services companies?
18. In addition to matching job applicants with available positions, what larger function do online job recruitment companies fill? Explain how such companies can affect salaries and going rates.
19. Describe the business model of on-demand service companies.
20. Why are on-demand service companies viewed as being disruptive and controversial?

PROJECTS

1. Access the EDGAR archives at Sec.gov, where you can view 10-K filings for all public companies. Search for the 10-K report for the most recent completed fiscal year for two online retail or online service companies of your choice (preferably ones operating in the same industry, such as Expedia and Booking Holdings, etc.). Prepare a presentation that compares the financial stability and prospects of the two businesses, focusing specifically on the performance of their respective e-commerce operations.
2. Find an example not mentioned in the text of each of the four primary types of online retailing business models. Prepare a short report describing each firm and why it is an example of the particular business model.
3. Drawing on material in the chapter and your own research, prepare a short paper describing your views on the major social and legal issues facing online retailers.
4. Choose a services industry not discussed in the chapter (such as legal services, medical services, accounting services, or another of your choosing). Prepare a three-to-five-page report discussing recent trends affecting online provision of these services.
5. Together with a teammate, investigate the use of mobile apps in the online retail or financial services industries. Prepare a short joint presentation on your findings.

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CHAPTER 10

Online Content and Media

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

10.1 Understand the major trends in the consumption of media and online content, the major revenue models for digital content delivery, digital rights management, and the concept of media convergence.
10.2 Understand the key factors affecting the online publishing industry.
10.3 Understand the key factors affecting the online entertainment industry.
10.4 Understand how creators are attempting to monetize user-generated content.

NEW Video Cases

See **eText Chapter 10** to watch these videos and complete activities:

10.1 Substack: An Alternative News Delivery Platform

10.2 Roblox and Online Gaming

Streaming Wars:

Who Will Win?

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First came movie theaters. Then came broadcast television. Then cable television. Then, along came CDs and DVDs, which enabled consumers to purchase movies to watch at home. With each new technological innovation, there also came a major shift in consumer viewing habits and the entertainment industry. Today, the Internet is just the latest in a long line of technological innovations that have disrupted the film and television industries throughout the years. The ever-evolving Internet has become an alternative distribution system for television and movies that can be streamed into viewers' homes. There are a plethora of players who want to get in on the action, and they are battling for supremacy in what has been termed the "streaming wars."

For years, television programming was delivered via broadcast television networks. Then cable and satellite TV became the dominant systems. Today, cable and satellite TV systems still provide television to about 65 million U.S. households. But the cable and satellite firms are having a difficult time holding onto subscribers, especially those in the 18-to-34-year-old range, who are increasingly moving to so-called over-the-top (OTT) Internet video streaming services. Cable TV is usually not popular with its users: It's too expensive (usually more than $100 a month), offers only linear TV rather than the ability to binge-watch a series, and requires subscribers to accept a bundle of hundreds of channels, most of little interest. The cable and satellite television providers like to boast that they offer hundreds, if not thousands, of channels. But who really watches that many channels?

As a result, more than 30% of U.S. households (called cord-cutters) have already dropped pay TV subscriptions. Cord-cutters, cord-nevers (the 17% of households that have never had pay TV), and cord-shavers (people who reduce their pay TV subscriptions to a minimum) will shrink the number of pay TV subscribers by more than 5% annually over the next five years. At the individual level (not households), more than 90 million individuals (almost 35% of the U.S. population) have dropped cable, while another 34 million (about 13%) have never had cable. Cable and satellite TV is not exactly a collapsing market, but it is not a market that is expanding, either.

And where are the cord-cutters and cord-nevers going? First stop is usually one or more of the big subscription video-on-demand (SVOD) services: Netflix, Amazon Prime Video, Hulu, Apple TV+, and/or Google's YouTube TV. In 2022, about 220 million people (about 65% of the U.S. population) are SVOD subscribers. Netflix has about 73 million

U.S. subscribers. Amazon Prime has more than 165 million members for whom Amazon Prime Video is available free of charge. Hulu has about 45 million subscribers. Apple TV+, launched in November 2019, reportedly has between 20 and 40 million subscribers. YouTube TV, which has focused primarily on live TV streaming rather than on SVOD, has about 5 million subscribers.

Other options are also abundant. CBS was one of the first broadcast networks to realize the serious threat posed by the "Internet Broadcasting System" and launched its own streaming, a la carte service, CBS All Access, in 2015. Rebranded as Paramount+ in 2022, the service provides access to more than 30,000 on-demand episodes of its current and past shows as well as live CBS programming (news, events, and sports) for a cost of $4.99 for an ad-supported plan or $9.99 without ads. Major cable programming provider HBO quickly followed suit, as did Showtime and Starz. Disney's ESPN unit launched its own streaming service, ESPN+, in 2018, and Disney itself followed suit in November 2019. Disney+ has leapfrogged over its rivals and now has around 150 million subscribers. A bit later to the game, NBC launched its Peacock OTT service in July 2020.

The traditional television content distribution system is facing an additional challenge. You may have heard the phrase "Content is king." In the past, this phrase referred to the quality of TV content being the most important feature. Today, the phrase has taken on a new meaning: Owning high-quality, prime content provides a golden opportunity to generate revenue by attracting paying subscribers and digital advertising. Technology companies want a piece of the action and are pouring hundreds of billions of dollars into creating original content or buying companies that already own content. Apple has joined Netflix, Hulu, and Amazon in the race to license, produce, and buy video content (or the firms that own the content).

For example, Netflix, the most successful SVOD service, also produces original series and movies. Netflix's first original series was *House of Cards*, which won numerous Emmy awards. Netflix introduces new series each year, including such hits as *Stranger Things, Squid Game*, and many others, and in the process has become a television network similar to those operated by broadcast and cable systems. Netflix spent almost $17.5 billion on original content in 2021 and reportedly plans to spend even more in 2022. Amazon has created Amazon Studios, which produces a number of original series, such as *The Rings of Power, The Marvelous Mrs. Maisel*, and *The Man in the High Castle*. Hulu has also produced a number of original series such as the acclaimed series *The Handmaid's Tale*. Apple's spending on original content is expected to exceed that of Amazon within the next several years, and Apple, too, has had a number of hits, such as *Ted Lasso*. Traditional cable and broadcast companies are scrambling to keep up. Collectively, the various players are expected to spend more than $140 billion across entertainment and sports content in 2022.

The television/movie production ecosystem benefits from SVOD because it no longer needs to depend solely on broadcast or cable channels to distribute their content. A shortage of producers, directors, cinematographers, and actors has arisen, as Internet giants compete for talent. In 2021, there were a record 559 scripted original series in production, more than double the 216 series produced in 2010.

Content producers also face new opportunities and risks. In the past, cable content providers, such as Discovery Channel, TNT, History Channel, TBS, FX, and others, all of which

SOURCES: "Pay TV Households & Viewers, US," Insider Intelligence/eMarketer, September 2022; "Disney+ Hikes Prices and Sets Fees for Its Ad-Supported Tier—Beating Netflix Out of the Gate," by Jeremy Goldman, Insider Intelligence/eMarketer, August 11, 2022; "YouTube TV Now Has More than 5 Million Users, Topping Hulu's Live TV Service," by Todd Spangler, Variety.com, July 12, 2022; "Q2 2022 Digital Video Trends," by Ross Benes, Insider Intelligence/eMarketer, June 21, 2022; "Despite Netflix's Stumble, Hollywood's Content Spend May Increase in Near-Term," by Caitlin Huston, Hollywoodreporter.com,

create or commission original content, were the major content producers. They earn money by charging cable and satellite providers for the right to distribute their content. However, the cable industry is highly concentrated, and a few firms (Comcast, Charter Spectrum [formed by the merger of Charter, Time Warner Cable, and Bright House Networks], and Altice [Optimum Online]) control access to more than 90% of U.S. homes. In the past, content producers were in a weak bargaining position. In the new Internet distribution system, however, content producers now have a number of alternatives, such as licensing their content directly to Netflix, Amazon, Hulu, YouTube, Apple, or other pay-for-content Internet providers or even streaming the content themselves.

Although the number of cord-cutters is increasing, more than 50% of U.S. households still subscribe to cable, which provides local news, comes with a discounted triple play, and provides coverage of national sporting events. The future of pay cable TV at this point still appears relatively secure. In addition, SVOD services have started to raise their prices. The average cable-cutter who signs up for several SVOD services is paying, on average, more than $30 a month in addition to paying for Internet service, and there are limits to how much, and for how many services, consumers will be willing to pay. As a result, several of the major players, including Netflix and Disney+, have decided to add an advertising-supported tier. How receptive consumers will be remains unknown. The likely near-term future continues to be a mixed cable/Internet environment. Although consumers may benefit from competition, they are also likely to be overwhelmed by the existence of so many choices.

April 28, 2022; "Q1 2022 Digital Video Trends," by Ross Benes, Insider Intelligence/eMarketer, March 25, 2022; "US Subscription Video Landscape 2020," by Ross Benes, eMarketer, Inc., February 20, 2020; "With Disney's Move to Streaming, a New Era Begins," by Brooks Barnes, *New York Times*, August 9, 2017; "Apple Poaches Sony TV Executives to Lead Push into Original Content," by Tripp Mickle and Joe Flint, *New York Times*, June 16, 2017; "YouTube's Live TV Streaming Service Goes Live in Five US Cities for $35 per Month," by Greg Kumparak, Techcrunch.com, April 5, 2017; "Showtime to Introduce Net Streaming Service in July," by Emily Steel, *New York Times*, June 3, 2015; "HBO's Streaming Service Will Start in April, Initially on Apple Devices Only," by Emily Steel, *New York Times*, March 9, 2015; "CBS Becomes First Major Network to Launch Internet TV Service: You Can Watch 'The Good Wife,' but not the NFL," by Jacob Kastrenakes, Theverge.com, October 16, 2014.

The opening case illustrates how online content distributors like Netflix, Amazon, Hulu, Apple, and others are moving into premium content production and sales and also becoming alternative providers of traditional television and movie content, rivaling existing cable and satellite distributors. If consumers can find their favorite television shows and movies online, then why should they pay for cable or satellite TV, especially when a variety of devices enable users to display their computer and phone screens on a home TV set? As Internet users increasingly change their reading and viewing habits, spurred by the growth of mobile devices, they are challenging the existing business models that worked for decades to support newspapers, books, magazines, television programs, and Hollywood movies. Today, the print industry, including newspapers, books, and magazines, is having a difficult time coping with the movement of their readership to digital alternatives. Broadcast and cable television, along with Hollywood and the music industry, are also wrestling with outdated business models based on physical media. Established media giants are continuing to make extraordinary investments in unique online content, new technology, new digital distribution channels, and entirely new business models in order to stay relevant to the Internet audience. Internet giants like Apple, Google, Amazon, and Meta are competing with the established firms for dominance in online content creation and distribution.

10.1 ONLINE CONTENT

No other sector of the U.S, economy has been as challenged by the Internet and the Web as the content industries. In this chapter, we will look closely at the print industries (newspapers, magazines, and books) and the entertainment industries (television and movies, music and radio, and games) as they attempt to transform their traditional media into digitally deliverable forms and experiences for consumers while earning profits. These industries make up the largest share of the commercial content marketplace, both offline and online. In each of these industries, there are powerful offline brands, significant new online-only providers and distributors, consumer constraints and opportunities, a variety of legal issues, and mobile platforms that offer an additional content distribution system. We conclude the chapter with a brief look at user-generated content and creators.

Table 10.1 describes the most recent trends in online content and media for 2022–2023.

CONTENT AUDIENCE: WHERE ARE THE EYEBALLS?

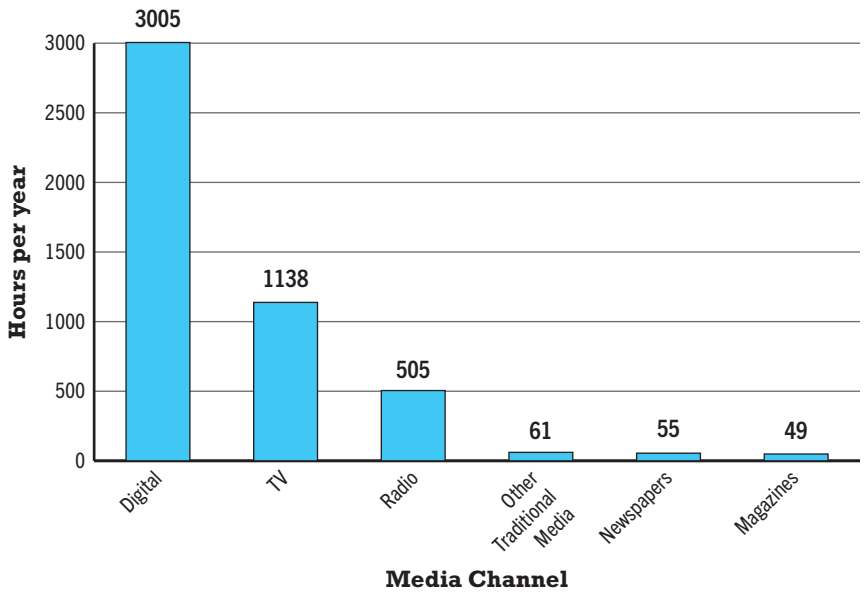
In 2022, the average adult in the United States is expected to spend more than 4,800 hours consuming various media, almost two and a half times the amount of time spent at work (2,000 hours/year) (see **Figure 10.1**) on page 608. In 2022, time spent with digital media is expected to account for about 62% of total media time spent. In the past, the number of hours of TV viewing was far larger than the number of hours spent with digital media, but this began to change with the development of the mobile platform. Today, time spent on mobile devices

TABLE 10.1 WHAT'S NEW IN ONLINE CONTENT AND MEDIA, 2022–2023

BUSINESS
• Streaming wars: A plethora of streaming subscription options amid an economic downtown results in slower growth of streaming subscription services, leading to a shift to an advertising-supported revenue model.
• Amazon, Hulu, Netflix, and Apple continue to be significant players in the content production business, challenging the broadcast and traditional television and film production industries.
• The number of people in the United States who watch digital video continues to increase, to around 260 million people, which is more than 75% of the U.S. population.
• The number of people in the United States who watch digital video on subscription-based OTT television services continues to grow, to more than 220 million (about two-thirds of the U.S. population), with more than half of U.S. consumers' digital video time spent watching such services.
• Book publishing revenues remain stable as e-book sales' growth slows.
• Online readership of newspapers exceeds print readership. Online ad revenues and subscriptions have not grown enough to offset declining print ad revenues.
• Podcasting becomes increasingly popular.
• User-generated content, creators, and the creator economy are having an increasing impact on the online content and media landscape.
TECHNOLOGY
• Smartphones, tablet computers, and e-readers together create a rich mobile entertainment environment.
• Streaming services consume an increasing amount of Internet bandwidth.
• Apps morph into content-distribution platforms that are proprietary, which means that users can be charged for content.
• Cloud services continue to grow to serve the huge market for mobile content.
• Advances in augmented and virtual reality technologies fuel development of the metaverse.
SOCIETY
• Media consumption: U.S. consumers spend almost 13 and a quarter hours (more than half the day) consuming different types of media.
• Time spent using digital media (about eight and a quarter hours a day) accounts for more than 60% of the time spent with media overall and vastly exceeds time spent with television. Time spent on mobile devices (about four and a half hours a day) is now more than double the time spent on desktops (about two hours a day).

plus time spent on desktops/laptops and other connected devices consumes about eight and a quarter hours per day compared to just more than three hours spent watching television on a TV (Insider Intelligence/eMarketer, 2022a). On the other hand, a great deal of Internet usage involves watching digital video, including television shows and movies. In 2022, around 260 million people (more than 75% of the U.S. population) watch digital video, and about 220 million people (about two-thirds of the U.S. population) watch video provided by an over-the-top television subscription service (Insider Intelligence/eMarketer, 2022b, 2022c). The distinction between Internet usage and television usage is not easy to make. Only the method of transmission is different: cable and satellite TV versus the Internet.

FIGURE 10.1 ANNUAL MEDIA CONSUMPTION IN THE UNITED STATES



In 2022, U.S. adults are expected to spend more than 4,800 hours consuming various types of media, with the vast majority of those hours spent with various forms of digital media.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022a; authors' estimates.

Initially, researchers believed that time spent on the Internet would reduce consumer time available for other media. This is referred to as cannibalization. The alternative argument was that the Internet and traditional media are complementary and mutually supportive rather than substitutive. The most recent data reveals a complex picture. Television viewing remains strong, video viewing on all devices has increased, and the reading of all kinds of books, including e-books and physical books, has increased. "Smart" connected television sets are Internet-enabled, allowing consumers to use the Internet to view TV shows on their traditional TVs. Total music consumption measured in hours a day spent listening to music has increased even as sales of CDs drastically declined; likewise, movie consumption has increased even as DVD sales also declined markedly. Nevertheless, the bottom line is that physical media are declining relative to digital media for all kinds of content.

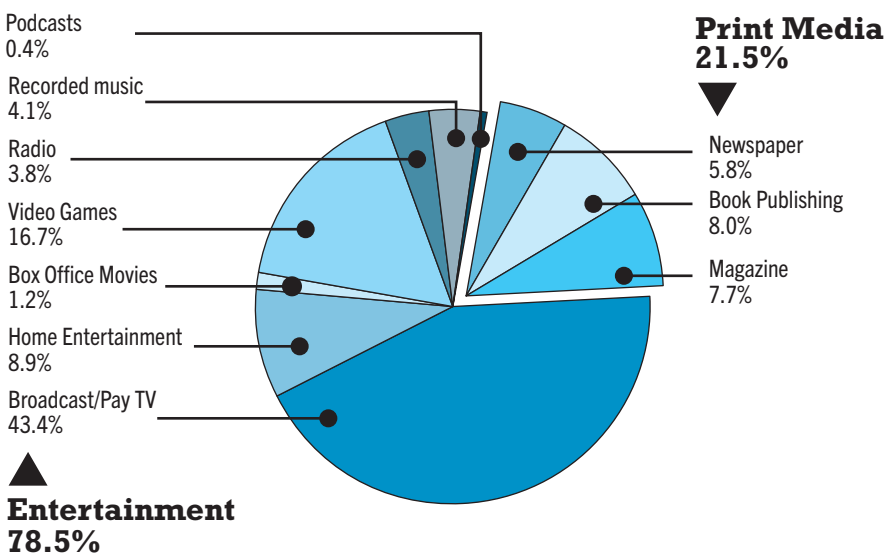
Generation Z (sometimes also referred to as just "Gen Z" for short), the generation born between 1997 and 2012, are often thought to behave very differently from previous generations. For a discussion of how Gen Z differs in media consumption, see *Insight on Society: Is Gen Z Really All That Different?* on pages 610–611.

CONTENT MARKET: ENTERTAINMENT AND MEDIA INDUSTRY REVENUES

In 2021, U.S. entertainment and media industry revenues (both traditional and digital, and including all forms of revenue, such as advertising, subscription fees,

and consumer purchases) were estimated to be about $360 billion. The various entertainment industries (television, movies, music and podcasts, and games) together accounted for about 78.5% of total revenues, with the print media industries (books, newspapers, and magazines, both physical and digital) collectively accounting for about 21.5%. Within the entertainment industries, the television and movie industries (including broadcast and traditional pay TV, home entertainment subscriptions and download services, and box office movies) accounted for the lion's share of revenues, together representing about 54% of total revenues. However, the video game industry is rapidly rising in importance, now accounting for about 17%. The music industry, in the forms of recorded music (both physical and digital) and radio, has remained fairly static, accounting for about 8%. Podcasting is a form of audio entertainment that is akin in many ways to "talk radio." A podcast is a digital audio presentation that can be downloaded from the Internet and then listened to at the listener's convenience. Podcasting revenues currently comprise only a small percentage of total revenue (less than 1%) but are growing rapidly (see **Figure 10.2**). Smartphones and tablet computers have created new revenue streams for entertainment and media firms. Content is no longer tied to physical products but can be delivered over the Internet from cloud servers to multiple mobile devices, reducing costs for consumers.

FIGURE 10.2 **U.S. MEDIA REVENUES BY CHANNEL**



The various entertainment industries generate almost 80% of U.S. media revenues.

SOURCES: Based on data from industry sources; authors' estimates.

INSIGHT ON SOCIETY

IS GEN Z REALLY ALL THAT DIFFERENT?

Every generation gets a nickname that is supposed to help set the people born within that generation apart from those who came before them and those who will come after them. The Silent/Greatest Generation (those born before 1946) came of age during the Great Depression and served in World War II. The Baby Boomers (1946–1964) grew up with the civil rights movement, political unrest, and rock and roll. Generation X (1965–1980) continued the trends of the Baby Boomers, except more so. Generation Xers were the first generation since the Depression to experience a slowdown in living standards and a growing sense that they might not earn as much as their parents did. Those born between 1981 and 1996 are called Millennials, as a nod to the fact that most of them began to come of age as the twentieth century turned into the twenty-first century. The newest generation is referred to as Generation Z, or just Gen Z for short. These are today's kids, teens, and young adults born between 1997 and 2012, with the oldest of the cohort in their mid-20s in 2022. Gen Z is just the latest in a long line of generations to have generalizations made about them.

Gen Z is the first generation of true digital natives. While older generations may perceive the Internet, Web, mobile platform, and social media as something that was "new" at some point in their lives, this is not true of Gen Z. For them, all these things have always been part of life. They have grown up in an environment that provides on-demand information, streaming entertainment, and instantaneous communication, and as a result, they have come to expect it as a matter of course.

Nearly all of Gen Z (more than 90%), even the youngest members, are online, where they spend, on average, more than four hours a day. Most use smartphones as the gateway to online content. They like entertainment and typically use their smartphones to access it. For instance, they are more likely to listen to audio, particularly streaming audio from services such as Spotify, Pandora, and YouTube Music, on a smartphone rather than on a traditional device, but 55% also listen to AM/FM radio every day, most frequently when they are in cars but also in other places. Gen Z-ers also listen to podcasts, with a recent survey finding that they are just as likely as Millennials to do so. As they mature, Gen Z-ers are likely to engage with podcasts even more frequently.

Not surprisingly, Gen Z-ers love videos. For instance, a recent Google survey found that 50% of Gen Z-ers surveyed said they didn't know how they would get through life without video. In addition, according to a joint study conducted by Snap (the parent company of Snapchat) and Omnicom Media Group, mobile and social media video consumption grew among Gen Z-ers during the pandemic, with experts predicting that this trend is here to stay. Snap surveyed 1,000 people ages 13 to 34 and found that 56% of them watched videos on streaming apps and platforms such as Netflix and Hulu. More than 60% watched videos on social media apps, with more than half watching these videos on a smartphone. Netflix and Amazon Prime are popular "binge" targets for Gen Z-ers. In assessing Gen Z's post-quarantine media habits and content consumption, marketing research firm YPulse predicts that Netflix will be their TV platform of choice but notes that social media content could begin cannibalizing the time that Gen Z-ers spend on streaming services. Gen Z-ers appreciate short, action-packed videos such as webisodes, tutorials, and video clips from both professional and amateur creators. But that's not to say that Gen

Z-ers do not read books: They do, but they are spending less time doing so than previous generations and are more likely to discover books by using social media.

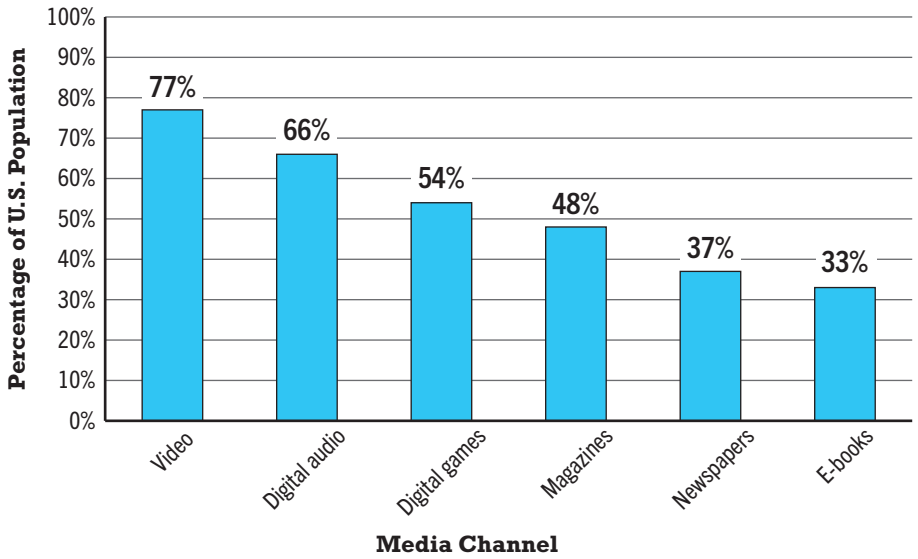
As more and more members of the Gen Z generation reach their teenage years, their participation in social networks is increasing. TikTok, Instagram, and Snapchat are the social networks that are the most popular with this generation. (They are not as fond of Facebook.) Social networks are also where Gen Z primarily gets its news, often tuning in the first thing each morning on their smartphones. According to one study, only 12% of Gen Z-ers get most of their news from television, compared to 43% of all other adults. The Reuters Institute for the Study of Journalism found that Gen Z-ers expressed strong interest in news formats that were more visual and easier to consume than a long, text-based news article. Gen Z-ers also value authenticity and individuality when it comes to news consumption and expect brands to match their personal values and to exhibit an honest commitment to corporate responsibility. For example, Gen Z readers are the ones leading the charge for more inclusive newsrooms and for more representative leadership. In a recent DoSomething survey, 75% of Gen Z-ers said that the top action they wanted to see from brands was ensuring employee and consumer safety, with 73% wanting brands to protect their employees financially. Brands that share positive messages on social media while failing to support their staff are being noticed by this generation. If a brand is not being authentic, Gen Z-ers will be the first to raise a red flag. Gen Z possesses a passion for social change that has earned them the nicknames "philanthrokids" and "philanthroteens." They display a remarkable awareness of all the latest issues. Social media apps are helping to leverage this hyper-awareness to bring about change through the use of hashtags, challenges, viral videos, and fundraisers.

Finally, gaming plays a central role in many Gen Z-ers' lives, which includes not only playing games themselves but also watching others play games on livestreaming channels such as Twitch and in e-sports tournaments. In some cases, these activities have supplanted Gen Z's interest in traditional live sports. In addition, Gen Z is likely to be much more receptive to participating in the metaverse, as they are already among the most interested in, and among the most avid adopters of, augmented and virtual reality technologies. Having grown up in a hybrid online-offline environment, they are likely to see this environment as a much more natural experience than older generations do.

As with all oversimplified characterizations of entire generations, it's a mistake to think of Gen Z as a single group. The Gen Z population is actually many different communities, each with different tastes and consumption patterns. Gen-Zers are indeed different, but not so different that we don't recognize them. They are inheritors of very powerful digital technologies, to be sure, but also inheritors of several thousand years' worth of literature, history, and culture, which they continue to find of enduring value.

SOURCES: "Demographic Report: Generational Cohorts 2022," by Jingqiu Ren, Insider Intelligence/eMarketer, August 1, 2022; "Gen Z, Millennials Drive Facebook's Drop," by Sara Lebow, Insider Intelligence/eMarketer, July 8, 2022; "Gen Z Social Usage Rising as Their Parents Start to Log Off," by Debra Aho Williamson, Insider Intelligence/eMarketer, June 28, 2022; "How to Engage Volunteers and Donors of Every Generation," by Adelyne Bejjani, Civicchamps.com, May 23, 2022; "Generation Z in the United States," by GWI, Globalwebindex.com, 2022; "US Generation Z Technology and Media Use," by Victoria Petrock, Insider Intelligence/eMarketer, November 15, 2021; "What Publishers Need to Know about Gen Z News Consumption," by Ali Gordon, Lineup.com, March 23, 2021; "Pandemic Fuels Gen Z's and Millennials' Love for Mobile Video Content," by Joseph Pimental, Ny1.com, February 25, 2021; "Want to Reach Gen Z & Millennial Podcast Listeners? Here's What You Should Know," by Kewlshrek, Ypulse.com, February 24, 2021; "2020: The Year that Changed Video Consumption," Forbusiness.snapchat.com, February 23, 2021; "Comparing the Reading Habits of 5 Generations," Readandsurvive.com, January 21, 2021; "Five Undeniable Truths about Marketing to Gen-Z," by Jeff Fromm, Forbes.com, January 7, 2021; "Gen Z Listeners in the U.S. Are Heavy Users of Streaming, but 55% Listen to AM/FM Radio Every Day," Edisonreach.com, July 30, 2020; "Covid-19's Impact on Millennial and Gen Z Media Habits—And How Markets Should Pivot," by Jessica Hawthorne-Castro, Hawthorneadvertising.com, July 9, 2020; "Half of Gen Z, Millennials 'Don't Know How They'd Get through the Day without Video,'" by Robert Williams, Marketingdive.com, March 11, 2020; "Children Are Reading Less than Ever Before, Research Reveals," by Donna Ferguson, Theguardian.com, February 29, 2020; "Defining Generations: Where Millennials End and Generation Z Begins," by Michael Dimock, Pewresearch.org, January 17, 2019.

FIGURE 10.3 ONLINE CONTENT CONSUMPTION IN THE UNITED STATES



SOURCES: Based on data from Insider Intelligence/eMarketer, 2022b, 2022d, 2022e; Pew Research Center, 2022a; Comscore, Inc., 2022.

ONLINE CONTENT: CONSUMPTION, REVENUE MODELS, AND REVENUE

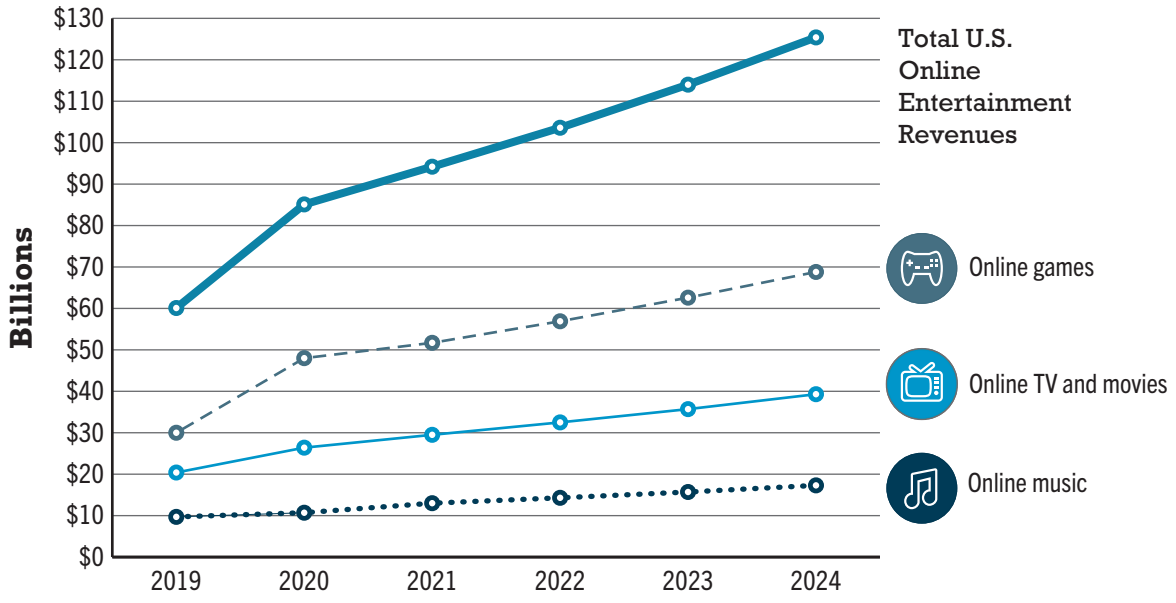
Now let's look at what kinds of online content people in the United States consume in 2022 (**Figure 10.3**). It's not a surprise that more than 75% of the U.S. population watches online video of various kinds, but it may be a surprise that almost 50% of the U.S. population reads a magazine such as *People* online. Listening to digital audio (both music and podcasts) and playing digital games are also very popular. The percentage of the U.S. population that reads e-books initially grew at triple-digit rates when the Kindle was introduced in 2007, followed by the iPad in 2010, but has since leveled off to about 30% of the population. What this reveals is that people have retained their affinity for traditional formats—TV shows and movies, music and radio, news, games, and books—and have brought those tastes to the Internet and their mobile devices.

In the 1990s and early 2000s, multiple surveys found that a large percentage of the Internet audience expected to pay nothing for online content, although equally large percentages were willing to accept advertising in return for free content. In reality, on the early Web, there wasn't much high-quality content. Few initially thought that the pay model could compete with the "free" model, and many analysts believed that information on the Internet needed to be free. The movie industry, cable TV systems, and cable content providers had a totally different opinion: They had always charged for services and content, and their executives and investors never thought information should be free. The culture of the Internet began to change when Apple introduced its iTunes Store in 2003 as a source of relatively inexpensive, high-quality music and when firms such as YouTube (and its parent, Google), which started out with a business model based on amateur videos and illegally uploaded music videos, began cooperating closely with Hollywood and New York production studios to receive premium content.

Today, there are three revenue models for delivering content on the Internet. The two pay models are subscriptions (usually "all you can eat") and a la carte (pay for what you use). The third model uses advertising revenue to provide content for free, sometimes with a freemium (higher-price) option. Contrary to early analysts' projections that "free" would drive "paid" out of business, it turns out that all three models are viable. Consumer behavior and attitudes toward paying for content have greatly changed from the early years, and today, millions of Internet users are more than willing to pay for high-quality, unique content delivered on a convenient device such as a smartphone, tablet computer, or e-reader and using services like those offered by Netflix, Apple TV, or Amazon Fire TV. Consumers have also gladly accepted free, advertiser-supported content. There's nothing contradictory about all three models working in tandem and cooperatively: Free content can drive customers to paid content, as streaming services like Pandora and Spotify have discovered.

Figure 10.4 shows estimated U.S. online entertainment content revenues for games, TV and movies, and music, projected to 2024. Total online entertainment revenue is expected to more than double from 2019 to 2022. Online games generated the most revenue in 2021 and are expected to continue growing through 2024, albeit at a slower rate than previously. Online TV and movies generated the second-most revenue in 2021. Although revenue from online music sales in the form of downloads has declined significantly, music streaming revenues have offset the decline in downloads, and overall revenues from digital music are also expected to grow over the next several years.

FIGURE 10.4 GROWTH OF U.S. ONLINE ENTERTAINMENT CONTENT REVENUES



SOURCES: Based on data from industry sources; authors' estimates.

DIGITAL RIGHTS MANAGEMENT (DRM) AND WALLED GARDENS

digital rights management (DRM) refers to the combination of technical and legal means for protecting digital content from unlimited reproduction without permission

Digital rights management (DRM) refers to a combination of technical (both hardware and software) and legal means for protecting digital content from unlimited reproduction and distribution without permission. DRM hardware and software encrypts content so that it cannot be used without some form of authorization, typically based on a payment. The objective is to control the uses of content after it has been sold or rented to consumers. Essentially, DRM can prevent users from purchasing and making copies for widespread distribution over the Internet without compensating the content owners. Although music tracks in the iTunes Store were originally protected by DRM, Apple eventually abandoned the practice because of user objections and because Amazon had opened an online music store without any DRM protections, with the support of music industry firms, who had come to realize that DRM was preventing the music industry from exploiting the opportunities of the Internet and perhaps even encouraging an illegal market. Streaming content services are inherently difficult to copy and re-distribute. Streaming video is technically difficult for the average user to capture and share, although various apps make live re-streaming very easy even if the quality is low. Likewise, streaming music is cumbersome to record and share.

walled garden refers to a kind of DRM that uses proprietary file formats, operating systems, and hardware to control the use of content after initial sale

Walled gardens are a kind of DRM that also restricts the widespread sharing of content. They do this by tying the content to the hardware, operating system, or streaming environment. For instance, e-books purchased from Amazon can be read only on a Kindle device or with the Kindle app, and Kindle books cannot be converted to other formats. By locking the content to a physical device or to a digital stream with no local storage, the device makers derive additional revenues and profits by locking customers into their service or device and also satisfy the demands of content producers to be fairly compensated for their work.

Google's YouTube identifies and tracks copyrighted music and video and removes the content if the copyright owner has not granted permission to share it and offers owners the revenue from advertising if they choose to let the content remain on the site. These efforts have not eliminated pirated content, but they have greatly reduced its prevalence in the United States.

MEDIA INDUSTRY STRUCTURE

The U.S. media industry prior to 1990 was composed of many small, independent businesses specializing in content creation and distribution in the separate industries of film, music, television, books, magazine publishing, and newspaper publishing. During the 1990s and into the twenty-first century, and after an extensive period of consolidation, huge entertainment and publishing media conglomerates have emerged.

The U.S. media industry is still organized largely into three separate, vertical stovepipes: print, movies/TV, and music. Each segment is dominated by a few key players, and generally there has been very little crossover from one segment to another. For example, newspapers typically do not also produce films, and publishing firms do not own newspapers or film production studios. The purchase of the *Washington Post* in 2013 by Jeff Bezos, the founder of Amazon and an Internet mogul in his own right, was an anomaly. Even within media conglomerates that span several different media segments, separate divisions generally control each media segment.

Initially, delivery platform firms, such as Comcast, Altice, AT&T, Verizon, Sprint, and Dish Network, did not focus on the creation of content but instead moved content produced by others across cable, satellite, and telephone networks. However, as revenues from traditional cable Internet and wireless telecommunications slowed, these firms decided that they should try to get into the content/advertising business as well, in an effort to generate additional revenues. Comcast led the way with its acquisition of a majority interest in NBC Universal. Then AT&T merged with Time Warner, and Verizon purchased both AOL and Yahoo.

However, the effort proved to be much more difficult than anticipated. Within three years of its acquisition of Time Warner, AT&T acknowledged that it was a major mistake, and in 2021, AT&T announced a deal with cable network Discovery to combine the assets of WarnerMedia (including HBO and Warner Brothers) with those of Discovery into a new, stand-alone entertainment company, with AT&T returning to its focus on broadband communications. Verizon's acquisition of AOL and Yahoo was also a costly mistake for Verizon, with Verizon selling its media holdings to a private equity group in 2021.

MEDIA CONVERGENCE: TECHNOLOGY, CONTENT, AND INDUSTRY STRUCTURE

Media convergence is a much-used but poorly defined term. There are at least three dimensions of media to which the term *convergence* has been applied: technology, content (artistic design, production, and distribution), and the industry's structure as a whole. Ultimately for the consumer, convergence means being able to get any content you want, when you want it, on whatever platform you want it—from an iPad to an Android phone or an iPhone and to a desktop/laptop computer PC or a set-top device like Apple TV or Amazon Fire TV.

Technological Convergence

Convergence from a technology perspective (**technological convergence**) involves the development of hybrid devices that enable the delivery of various types of media, such as books, newspapers, television, movies, audio, and games, via a single device. Examples of technological convergence include tablet computers such as the iPad and smartphones such as the iPhone and Android phones, which combine telephone, print, music, photos, and video in a single device.

technological convergence development of hybrid devices that can enable the delivery of various types of media via a single device

Content Convergence

A second dimension of convergence is **content convergence**. There are three aspects to content convergence: design, production, and distribution.

content convergence convergence in the design, production, and distribution of content

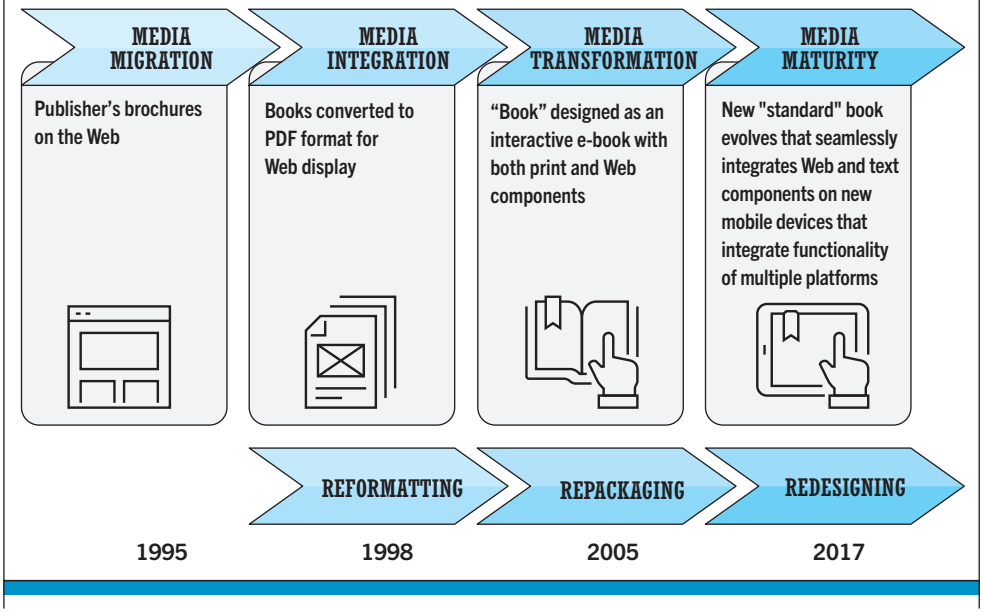
There is a historical pattern in which content created in an older media technology migrates largely intact, with little artistic change, to a new technology. Slowly, the different media are integrated so that consumers can move seamlessly back and forth among them, and artists (and producers) learn more about how to deliver content in the new media. Later, the content itself is transformed by the new media as artists learn how to fully exploit the capabilities in the creation process. At this point, content convergence and transformation has occurred: The art is different because of the new capabilities inherent in the new tools. For instance, European painters of the fifteenth century in Italy, France, and the Netherlands (such as van Eyck, Caravaggio, Lotto, and Vermeer)

quickly adopted new optical devices such as lenses, mirrors, and early projectors called *camera obscura* that could cast near-photographic-quality images on canvases, and in the process they developed new theories of perspective and new techniques of painting landscapes and portraits. Suddenly, paintings took on the qualities of precision, detail, and realism that were found later in photographs (Boxer, 2001). A similar process has occurred over the past few decades as artists and writers assimilate new digital and Internet tools into their toolkits. For instance, GarageBand from Apple enables low-budget, independent bands (literally working in garages) to mix and control eight different digital music tracks to produce near-professional-sounding recordings on a shoestring budget. Writers of books and their publishers are turning to digital video and simulations to heighten the user experience. Online newspapers are changing the news cycle to a 24-hour stream, producing their own video channels, and expanding user commenting opportunities on their websites.

On the production side, tools for digital editing and processing (for film and television) are driving content convergence. Given that the most significant cost of content is its creation, if there is a wide diversity of target delivery platforms, then it is wise to develop and produce only once, using digital technology that can deliver to multiple platforms.

Figure 10.5 depicts the process of media convergence and transformation using the example of books. For example, consider this textbook. Today, this book is moving closer to the media maturity stage in which the book is available primarily as a digital product with substantial visual and audio content that can be displayed on many different digital devices. View the Figure 10.5 video in the eText for a more detailed and animated discussion of this figure.

FIGURE 10.5 CONVERGENCE AND THE TRANSFORMATION OF CONTENT: BOOKS



The Internet is making it possible for publishers and writers to transform the standard "book" into a new form that integrates features of both text and the Internet and also transforms the content of the book itself.

Industry Structure Convergence

A third dimension of convergence is the structure of the various media industries. **Industry convergence** refers to the merger of media enterprises into powerful, synergistic combinations that can cross-market content on many different platforms and create new works that use multiple platforms. This convergence can take place either through acquisitions or through strategic alliances. Traditionally, each type of media—film, text, music, television—had its own separate industry, typically comprised of very large players. For instance, the film entertainment industry traditionally was dominated by a few large Hollywood-based production studios; book publication is dominated by five large book publishers; and music production is dominated by four global music label firms.

industry convergence merger of media enterprises into powerful, synergistic combinations that can create and cross-market content on many different platforms

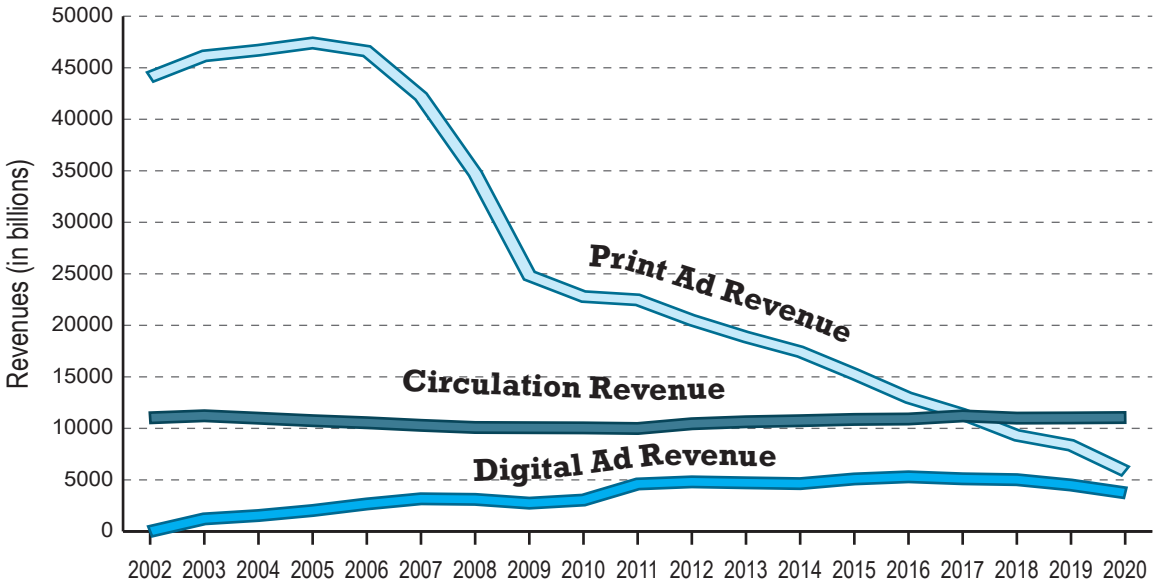
However, the Internet has created forces that make partnerships among media and Internet firms a necessary business proposition. Telecommunications companies tried to horizontally integrate by buying up content producers, although the effort did not go well and has now mostly been abandoned. In contrast, tech companies such as Amazon, Netflix, and Apple have been more successful in creating synergies with content creators. Initially, although they had the competencies and resources to pursue Internet content strategies, they did not have the competencies needed to create content. However, business combinations, licensing deals, and partnerships have solved many of these issues. Rather than acquiring large media companies outright, as some telecommunications companies tried to do, tech companies for the most part have instead relied on contractual arrangements with content companies to both protect intellectual property rights and create a business pricing model that both parties can accept. In addition, as time has passed, tech companies have developed the competencies necessary to produce content. For instance, Netflix, Hulu, and Amazon produce and distribute their own original TV series. Amazon created its own book imprint, Amazon Books Publishing, and entered the book publishing business. In this sense, the Internet is changing the media industry from what it was in the recent past.

In the end, consumers' demands for content anywhere, anytime, and on any device are pushing the technology and content companies toward both strategic alliances and strategic conflicts in their search for an advantage.

10.2 THE ONLINE PUBLISHING INDUSTRY

Nothing is quite as fundamental to a civilized society as reading text. Text is the way we record our history, current events, thoughts, and aspirations and transmit them to all others in the civilization who can read. Even television shows and movies require scripts. Today, the U.S. publishing industry (composed of books, newspapers, magazines, and periodicals) is moving rapidly to the Internet and mobile delivery. The Internet has offered the publishing industry an opportunity to move toward a new generation of newspapers, magazines, and books that can be produced, processed, stored, distributed, and sold online anytime, anywhere, and on any device. The same Internet also offers the possibility of destroying existing print-based publishing businesses that are not able to make this transition and remain profitable.

FIGURE 10.6 U.S. NEWSPAPER REVENUES



U.S. newspaper ad revenues have declined precipitously since 2006. As a percentage of total revenues, circulation subscription revenues have become more important. Digital advertising revenue has also become an important source of revenue.

SOURCES: Based on data from Pew Research Center, 2021a;, Newspaper Association of America, 2014.

ONLINE NEWSPAPERS

Newspapers in 2022 remain a troubled segment of the print publishing industry. U.S. newspaper industry revenues have shrunk from their high of almost $60 billion in 2000 to only about an estimated $20 billion in 2021 (see **Figure 10.6**). Smaller regional and local newspapers have been among the most impacted. The newspaper labor force has also dropped precipitously during this period. This extended period of digital disruption that has befallen the newspaper industry began with the rise of the Web in 2000 and the emergence of powerful search engines like Google, which allow consumers to search for and read news articles on any subject without having to browse a physical newspaper or an online edition. Although social media has become a major source of visitors to online newspapers, most of these visitors do not stay on a newspaper's site for more than the few moments that it takes to read a single article. These fleeting visitors typically do not engage with the newspaper as a whole or with its online ads. Even before the Internet and Web, however, newspaper revenue was falling because of the influence of earlier technologies like broadcast and cable television (Congressional Research Service, 2022; Pew Research Center, 2022b).

The striking growth of alternative, purely digital news sources in the last five years, from Twitter and Facebook to Vox, Vice, BuzzFeed, and Huffington Post, poses additional challenges. Online news sources are attracting millions of consumers every day and steering potential newspaper readers—both online and offline—away from the most valuable part of print- and digital-edition newspapers: the front page. In response, newspapers have hired their own social media editors to follow trending

topics and post articles to their own newsfeeds. Major newspapers have also focused on redesigning their websites and Facebook pages and on using push notifications of curated articles in topic areas of interest to their power users. Newspaper survival will depend on how quickly newspaper organizations can transform themselves from print to digital and on how quickly they can monetize the expanding audience for news all the time, anywhere, and on all devices.

As can be seen from Figure 10.6, while newspaper circulation revenues (subscriptions plus newsstand sales) have remained basically flat since 2000, print advertising has fallen precipitously, from a high of $48 billion in 2000 to a low of around $6 billion in 2020 (a more than $2 billion drop from 2019, due in part to the Covid-19 pandemic). Newspaper digital advertising revenues increased gradually from 2011 through 2016 and then flattened for a few years, before significantly dropping in 2020, again primarily due to the Covid-19 pandemic. Digital advertising revenues now make up about 20% of total revenues, but this revenue has not been nearly enough to compensate for the loss of print ad revenue. (Only the music industry suffered a similarly devastating decline in revenue.) The downward trajectory is expected to continue over the next several years, with various analysts predicting continuing annual declines in total revenue of anywhere from 2% to 6.5% (Dudley, 2022; ResearchandMarkets.com, 2022). The decline in newspaper revenues has resulted from four factors:

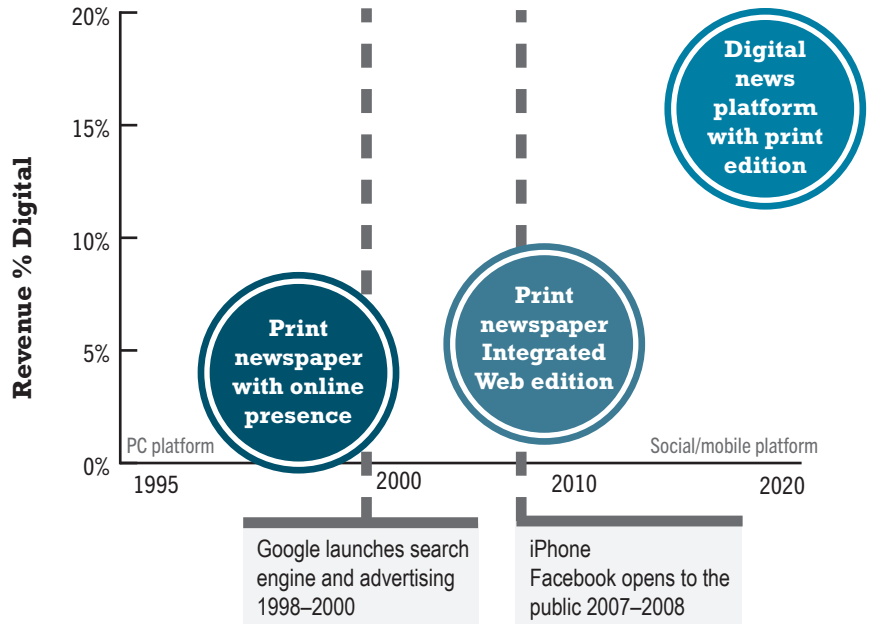
- The growth of the Web and mobile devices as an alternative medium for news and advertising. The movement of consumers online has drained billions of ad dollars (including classified ad dollars) from the printed newspaper. The same has not been true of television advertising, as we will discuss later in the chapter. Even radio advertising has stood up well during the digital revolution.
- The rise of alternative digital sources for news, commentary, feature stories, and articles.
- The difficulty that traditional newspaper firms and their managers have experienced in developing business and revenue models that could survive and even prosper on the Internet and the mobile/social platform.
- The rise of social media and search engines (primarily Google), which have directed users to news sites for individual articles rather than to the newspapers' websites.

From Print-Centric to Digital First: The Evolution of Newspaper Online Business Models

Since 1995, when e-commerce and digital advertising began, through to the present, newspapers have developed three distinct business models in an effort to adapt to the Internet and, more recently, to the mobile and social platform (see **Figure 10.7**). The three models are Print-Centric (1995–2000), Integrated Print/Web (2000–2010), and the current model, Digital First (2010–present). You can compare these models on four dimensions:

- **Search and discovery:** How do readers find the news?
- **Awareness:** How are potential readers made aware of the news?
- **Engagement:** How are readers engaged with the news and journalists?
- **Technology platform:** How, when, and where is the news delivered to readers? (*New York Times*, 2017).

FIGURE 10.7 ONLINE NEWSPAPER MODELS



Newspapers have gone through three different business models as they adapt to the Internet.

These milestones reflect important dates in the evolution of the Web and the mobile-social platform. In 1998 to 2000, Google launched its search engine and introduced search engine paid advertising based on its Page Rank algorithm. In 2007, Apple introduced its iPhone, creating a truly mobile and universal web device, and Facebook opened its site to the public and, in 2008, signed up more than 100 million users, creating the first large-scale, online social network.

Prior to the development of the Web, search engines, mobile devices, and social media platforms, readers discovered the news by browsing (a form of searching) the printed paper. They became aware of stories by reading the front page, section pages, and article titles. Except for a very small percentage of readers who wrote letters to the editor, readers typically did not engage with journalists, editors, or other contributors. Journalism was considered a profession, and readers were not expected to do much more than read and be fascinated, enlightened, and entertained by people who obviously were more informed than they were. Journalists worked all day on their articles and filed them at 5 p.m.; professional editors revised the articles, and compositors put the articles on the page for the presses, which ran after midnight. The news stream ended at 5 p.m. The technology platform was print, sometimes with color (which was a major innovation and expense in this period).

Despite the introduction of the Web and its growing popularity, newspapers retained their existing print-centric strategy and culture. In the Print-Centric period (from 1995 to 2000), newspapers created digital copies of their print editions and posted them online. Readers discovered stories as they had before: by reading the front page online, by following

links to stories, and by clicking on topic areas or sections (e.g., Sports or Technology). Stories were promoted by a business department that sought to enlarge the print audience and to attract advertisers based on readership and the number of online visitors. Digital advertising was very limited, in part because advertisers did not believe that it was effective. Readers were not engaged with journalists except to the extent that readers read the stories and could identify with the subjects of the stories. The business process of creating journalism did not change. Articles were still filed at 5 p.m. and still went to print editors, and then the articles were sent to the web team and the print group. There was little difference, if any, between the print and the online versions. The technology platform for the digital edition was the desktop or laptop, and news was consumed at home and at work.

In the Integrated Print/Web period (from 2000 to 2010), newspapers adopted multimedia elements such as video, added more interactive elements like crossword puzzles and contests, and provided more reader feedback opportunities, especially on opinion and editorial pages. There were opportunities to personalize the news using RSS feeds and to present news to the reader. Nevertheless, news was discovered primarily by the reader visiting the website; promoting content online was primarily limited to RSS feeds. Readers were somewhat more engaged, but the technology platform remained the desktop or laptop platform.

In the Digital First period (from 2010 to the present), three developments in the technology and popular audience platform occurred: the rapid adoption of smartphones and tablets and the equally astounding growth of social networks such as Facebook and Twitter, which began to dominate consumer time spent on the Web and mobile devices. In addition, the rise of digital news websites that are specifically focused on using the new technology and platforms has spurred newspapers to radically transform their business—or to go out of business. Today's platform is not based on personal computers using a browser but on mobile devices and apps, with desktops and laptops now just one pillar of the delivery platform. In this environment, the news does not stop at 5 p.m. but occurs 24/7. Stories start with an initial short article that is updated throughout the day, followed by thousands of tweets, which are then followed by millions of shares on multiple social networks. Often, amateurs on the scene know more about the news in the first hours of a story than what any collection of journalists in their offices know. Amateurs also provide video feeds and commentary to journalists.

The Digital First business model inverts previous models. The top priority in this model is producing the most engaging, continually updated digital edition, which is then followed by producing a print product based on the news developed in the digital edition. In the case of digital news startups, there is no print edition; instead, the news is just a continuous stream of updates, blogs, tweets, and posts rather than a fixed article. Digital news articles are time-stamped, indicating that an update is on the way and that the reader should return to follow the story. Instead of waiting for readers to discover the news or to search for the news via a search engine, the news is presented to readers via any of a variety of venues where they happen to be looking: social networks, mobile news feeds, e-mail, or Yahoo or Google News. Journalists remain paid professionals, but they now promote their stories and personas on social networks and on TV news shows. Their job is no longer simply reporting, writing, and getting the facts right but now includes promoting their stories and engaging readers on a personal level. Superior reporting and writing is no longer the sole criterion for hiring and advancement. More emphasis is now placed on reporters' abilities to attract audiences on their own social media pages and Twitter feeds.

The Digital First business model is not yet a total reality for traditional newspapers, although the largest print newspaper organizations, such as the *Wall Street Journal*, the *New York Times*, the *Washington Post*, and others, have begun the journey toward becoming Digital First news organizations. The *New York Times* initiated a Digital First model in 2014 and as of June 2022, had driven the number of its digital-only news subscribers to more than 6.1 million. The *Times* is continuing to become more digital by becoming more visual, by creating more original video and graphics, and by including audio tracks. It is also using more digital-native journalistic forms. In 2019, the *Times* exceeded $800 million in annual digital revenue for the first time, a goal it had pledged to meet by the end of 2020, and in 2021, it recorded digital revenues of almost $1.1 billion, surpassing the billion-dollar mark for the first time The *Wall Street Journal* has also launched a Digital First website, with redesigned web and video pages, iPad and Android apps, and a greater emphasis on breaking news stories that are refined over the course of a 24-hour news cycle; and as of June 2022, it had more than 3 million digital subscriptions (*New York Times*, 2017, 2022a, 2022b; Watson, 2022). The *Washington Post, USA Today*, and Bloomberg News have all made similar changes to succeed in a mobile-tablet-desktop digital marketplace.

Online Newspaper Industry: Strengths and Challenges

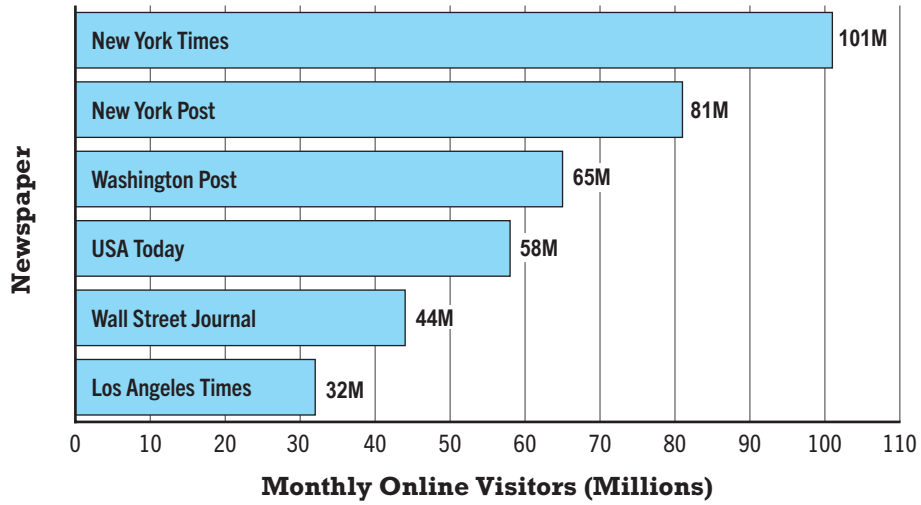
The newspaper industry still has some major strengths, which it will need to draw upon as it faces the challenges of the future. In the following section, we review those strengths and challenges.

Strength: Newspaper Audience Size and Growth More than 80% of U.S. adults surveyed by the Pew Research Center get their news via a digital device at least some of the time, with about 50% saying that they do so often. See **Figure 10.8** for a list of various newspapers in the United States in terms of unique monthly visitors online. The online newspaper is one of the most successful of all online media in terms of audience size.

Newspapers have responded to the changing audience by providing access to their content on all digital platforms. With more than 80% of people in the United States now accessing the Internet via a mobile device, newspapers have had to become truly multi-platform media by developing apps and websites that are optimized for mobile devices. According to a recent survey, about three-quarters of the highest-traffic news sites now have mobile apps. Mobile traffic is continuing to grow for most newspapers, whereas the number of desktop visitors is declining. Almost 60% of the U.S. adults surveyed reported that they often read the news on a mobile device. In contrast, only 30% of those surveyed reported that they often used a desktop or laptop computer to read the news. Mobile newspaper readership is especially strong among young people because of their greater usage of mobile devices. Young people (ages 18–29) are much more likely to read news online than are older people.

Surveys also show that more than 60% of U.S. adults get their news from news websites or apps at least some of the time. However, indicative of the challenges facing the traditional news industry, 60% say that they also get their news from search engines such as Google at least some of the time, while 50% say that they often or sometimes get their news from social media. Young people in particular are much more likely to get their news from social media. Because newspapers are now trying to meet users where they congregate, most newspapers have established a significant social media presence.

FIGURE 10.8 UNIQUE MONTHLY VISITORS AT U.S. ONLINE NEWSPAPERS



Online newspaper readership at leading national newspaper websites is expanding rapidly.
SOURCES: Based on data from Comscore, Inc., 2022; *Washington Post* PR, 2022.

For instance, the *Washington Post* now has more than 6 million Instagram followers and is using the platform to increase the number of subscriptions and attract a younger audience (Sternberg, 2022; Pew Research Center, 2022b, 2021a, 2021b, 2021c).

Online newspapers also attract a wealthy, educated, and consumer-intense demographic. Given the large online newspaper audience, it is clear that the future of newspapers lies in the online and mobile market because readership and subscriptions to the traditional print newspapers continue to decline at a steady pace.

Challenge: Digital Ad Revenue Although newspapers originally hoped that digital ad revenues would be their savior, thus far these revenues have not come close to replacing the amount of traditional ad revenues that newspapers historically generated, and over the past several years, digital ad revenue growth has flattened. Website visitors are increasingly coming from social media sites and search engines in order to find specific articles (so-called side-door entry) rather than coming directly to the newspaper's home page. These visitors typically are less engaged and less valuable. The less engaged visitors are (in terms of pages viewed, minutes spent on the site, and return visits), the less time there is to show them ads and earn revenue. If current trends continue, it is unlikely that newspapers will be able to rely on an increasing number of unique visitors or an increasing amount of digital ad revenues to reverse the revenue declines of the past decade. Instead, newspapers will need to build on their expanding digital subscription market, which is composed of loyal readers who visit the paper every day for curation and opinion. In 2020 through 2022, newspapers were also faced with the challenge of coping with the dramatic decline in advertising revenue of all types because of the Covid-19 pandemic and the uncertain, pandemic-induced economic conditions that have also slowed advertising spending.

Strength: Content Is King Why do people continue to buy newspapers and also pay for newspaper content online? The oft-repeated bon mot that "content is king" appears to be true in the case of print as well as online content of all kinds. The reason online newspapers attract exceptionally large and loyal audiences who are deeply engaged is simple: quality of content. Compared to other media, newspapers are the most trusted source of news and commentary on local, national, and international stories. A survey of more than 8,000 U.S adults found that newspapers were the most trusted source of news by far, followed by television news, with social media viewed as being the least trustworthy (Kearney, 2018). Local newspapers produce the highest levels of ad engagement: 35% of consumers report making purchases on the basis of local newspaper ads. Online display ads, e-mail campaigns, and fleeting mobile ads do not come even close to having these engagement levels.

Challenge: Finding a Revenue Model In 1995, when the first newspaper websites appeared, newspapers offered their content for free, requiring only that a reader register for the site. The hope was that advertising would support the website's operation and provide a new revenue stream for the print-edition content. In some cases, free content was limited to the most popular articles and did not include the classified ads, a lucrative newspaper franchise. At that time, print advertising provided more than 75% of revenues, and subscription revenue generated about 25% of revenues.

Charging for general newspaper content was an obvious answer, but publications that tried doing so during the 1995–2005 period were punished by an Internet culture that expected online content such as music and news to be free. Public willingness to pay for digital content of all kinds has changed greatly for reasons described earlier.

Newspapers (and online magazines as well) have benefited from the changes in public perception. A survey of 236 U.S. newspapers found that 77% had some sort of charge for online access. Of these, 72% used a **metered subscription** model (which provides access to a limited number of articles for free but requires payment of a subscription fee after that limit is exceeded); 20% provided most content for free but charged a subscription fee to access premium content; and only the *Wall Street Journal* used a hard **paywall** (no access to articles without a paid subscription) model (Edge, 2019; Lewis, 2018; American Press Institute, 2018).

metered subscription provides access to a limited number of articles for free but requires payment of a subscription fee after that limit is exceeded

paywall no access to articles without a paid subscription

Meanwhile, the News Media Alliance, a leading trade industry group of 2,000 news organizations, has proposed federal legislation that would allow newspapers to bargain as a group with Internet distributors such as Google and Meta for the use of the news organizations' news content. This legislation would require an exemption for the newspaper industry from the Sherman Antitrust Act, which prohibits such industry collaboration. The Alliance argues that Google and Meta have monopolized the online advertising industry, strangling the news organizations that produce the content (via reporting, editing, creating headlines, and writing stories) that is used or posted on Google and Facebook without compensation. The outlook for this legislation becoming law is slim, but it is another pressure point on the Internet titans to pay more for their use of content from legitimate news sites. In the meantime, Meta, which had a "pilot" agreement with a number of leading news organizations to license their content for its Facebook News tab, announced in July 2022 that it would no longer do so. A similar program by Google, Google News Showcase, which was launched by Google in response to new Australian and EU laws that require Google and Meta to pay for news content, has generally been shunned by U.S. publishers as woefully insufficient. (News Media Alliance, 2022; Lawler, 2022: Shah, 2021; Turvill, 2021).

Challenge: Growth of Digital-Only Competitors The Web has provided an opportunity for newspapers to extend their print brands, but at the same time, the Web has given digital entrepreneurs the opportunity to disaggregate newspaper content by creating specialized websites for popular content such as weather, classified ads (Craigslist), restaurant and product reviews (Yelp), as well as topical national and international news sites and apps that compete with online newspapers. Despite the declining revenues of the traditional print newspaper industry, entrepreneurs have poured money into news sites and even print newspapers. These investments were largely made in the belief that independent news and journalism are national treasures to be preserved in the Internet age.

Although print newspapers are attracting wealthy individual investors, venture capital investors have poured billions into purely digital online news sites. **Table 10.2** describes some leading native digital news sites. Native digital news companies grew rapidly in the period 2014–2019, and although their growth has slowed since then, today the top native digital sites have audiences comparable or exceeding those of nationally known newspapers. **Figure 10.9** lists some of these top sites in terms of their unique monthly visitors.

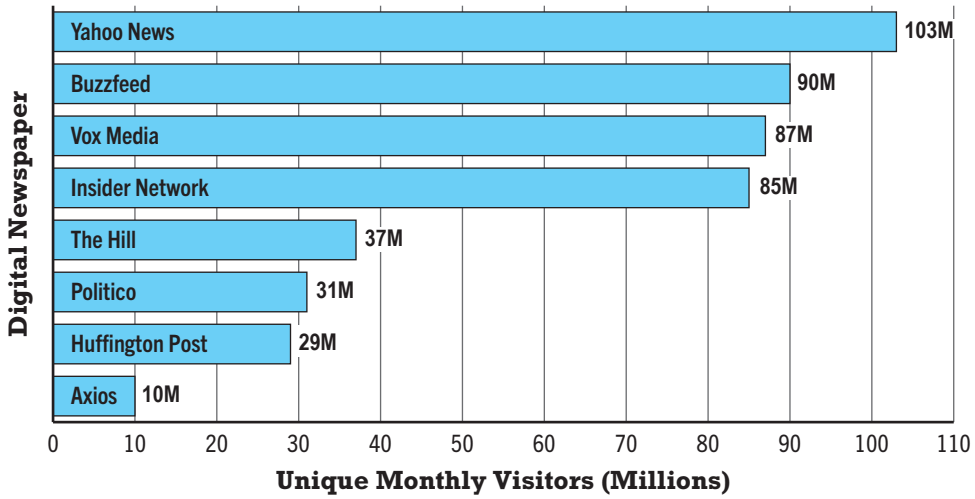
Not all digital news services succeed, and only a few have turned a profit so far. Many of the native digital sites in Figure 10.9 have had to reduce their staff in response to economic conditions. As it turns out, native digital news sites face the same problems as traditional newspapers face, namely, few loyal readers, lack of advertising revenues, and competition from Google and Meta. Even the disruptors are being disrupted (Hagey and Alpert, 2019).

Challenge: Surviving Digital Disruption The newspaper industry would appear at first glance to be a classic case of a disruptive technology—the Internet, mobile devices, and

TABLE 10.2 NATIVE DIGITAL NEWS SITES

COMPANY	DESCRIPTION
Huffington Post	Founded in 2005, sold to AOL for $350 million in 2011. Aggregates content from traditional news outlets, invited paid bloggers, legions of unpaid bloggers, and original reporting.
BuzzFeed	Founded in 2006. Focuses on using social media to generate viral stories, sharable content like quizzes and listicles ("The five most important people"), and photos. Also includes more traditional news topics like politics, business, and technology. Originally a news aggregator but now hires journalists for traditional news reporting. Went public in 2021.
Vox	Founded in 2014. Covers politics and general news. Eschews banner ads for sponsored videos and stories. See the *Insight on Business* case, *Vox: Native Digital News*, for more information on Vox and its parent company, Vox Media.
Politico	Founded in 2007. Covers politics and public policy in the United States and internationally. Currently has team of almost 900, with 700 of that number in North America. Sold to German publishing firm Axel Springer in 2021 for more than $1 billion.
Axios	Founded in 2016. Covers politics and general news. Articles are typically brief and use bullet points to make them easier to read. In 2022, agreed to be acquired by its lead investor, Cox Enterprises, a family-owned media company that generates most of its revenue from its cable and broadband businesses, for $525 million.

FIGURE 10.9 UNIQUE MONTHLY VISITORS AT NATIVE DIGITAL NEWS SITES



Although native digital news sites face challenges, they are significant competitors to established newspapers and their online editions.

SOURCES: Based on data from Comscore, Inc., 2022; *Washington Post* PR, 2022; Majid, 2022; CNN, 2021.

apps—destroying a traditional business model based on physical products and physical distribution. Incumbents (the existing print newspapers) slowly and incrementally improve their products over time. New firms—disruptors—introduce new products (Huffington Post, BuzzFeed, Vox), which are not as good as the incumbents' products but are based on newer and more powerful technologies. The new products are less expensive, or free, and target underserved or entirely new markets. They often are founded and promoted by people new to the industry. Eventually the disruptors' products are improved and become more acceptable, or good enough. At this point, the new products and the disruptors start draining significant market share from the incumbents, who eventually fail. Incumbents fail for a variety of reasons: an expensive legacy production process, large human capital investments, a contrary culture, or an inability to perceive rapid changes in the business and technology environment. See the *Insight on Business* case, *Vox: Native Digital News* for a more detailed look at one digital native news startup seeking to have a disruptive impact on traditional newspapers.

Purely digital news sites have many advantages over print newspapers. They don't have the cost of printing papers; they can create new workflows and business processes that are more efficient and timely; they have a lower cost structure, often relying on user-generated content and minimal payments to reporters and bloggers, with lower or no pension costs; and they can take advantage of newer technologies for producing the news. Although the quality of journalism on these digital-only sites initially was not as good as the quality of traditional print newspapers, this situation is changing as the digital-only sites hire talented journalists and editors from print newspapers that are experiencing financial difficulties.

INSIGHT ON BUSINESS

VOX: NATIVE DIGITAL NEWS

Vox Media, founded in 2003, has pursued a unique strategy from the beginning. Rather than creating a single digital news site, as, say, traditional newspapers have done, and showing tabs for various areas of interest (sports, business, or entertainment), it instead has unbundled the general news site into a number of focused niche sites, populating them with content from hundreds of different blogs that it has created or purchased. It started with SBNation, a collection of more than 300 individual sites that primarily focus on individual professional sports teams. Each SBNation site has its own name, URL, brand, and writers. Vox Media also owns a number of other specialty sites, which themselves are often collections of blogs or websites, including Eater (food), The Verge (culture), Polygon (gaming), Recode (technology), and its flagship general news and commentary site, Vox.com. These niche sites foster a much greater intensity of reader engagement.

Vox.com, the news site, was created in 2014 when Vox hired respected political reporter Ezra Klein from the *Washington Post*. Vox.com pioneered the "explanatory journalism" movement, which seeks to provide in-depth and detailed breakdowns of current events. Vox.com initially used a technique known as card stacks, which allowed readers to get their news in smaller increments, but later replaced it with a story template that it calls "packages," or groups of individual articles with their own landing pages that have a unifying theme, such as content pertaining to a particular city or a specific political topic. Vox wants its formats to appeal to mobile readers and social network users and wants its content to stand out compared to the digital versions of print newspapers. Vox's mission is to explain the news in a way that empowers people with the information and insight they need to understand the world around them by providing clarity and context in easy-to-digest language. Vox has been so successful in that regard that it even has been praised in the opinion pages of the *New York Times*.

Vox Media is often regarded as being on the cutting edge of digital news publishing because of its technology, culture, and business organization. One of the first priorities that Vox pursued was to invest millions of dollars in a content management system (CMS) called Chorus. Chorus goes beyond content creation and management because it provides the publishing environment as well. When reporters and editors have finished writing, they use Chorus to publish formatted content on various websites and social media. Chorus offers journalists unprecedented levels of control and customization, including the ability to engage with reader comments and to integrate content from others' stories. In 2018, Vox began licensing Chorus to other digital media platforms, and current users include the *Chicago Sun-Times* and the *Deseret News*, among others. In 2019, Vox acquired the Coral Project, an open-source commenting/moderation platform that is dedicated to building safer and more productive online communities and that is being used by more than 60 brands, including *The Financial Times* and the *Los Angeles Times*. In 2022, Coral was added to the Digital Public Goods Alliance Registry.

Unbundling news into more focused, vertical websites and harnessing technology to reduce the cost and improve the speed of content creation provided a good start for Vox. But to develop into a profitable business, a goal that it achieved for the first time in 2019, Vox has needed to diversify its revenue stream.

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In addition to its Chorus platform, Vox Media has developed Concert, a programmatic advertising network that reaches more than 230 million people. Launched with the help of its venture capital investor NBCUniversal, Concert is used by 100 media companies and more than 700 brands and has generated nearly 13 billion ad impressions. To further extend the Concert platform, in 2020, Vox partnered with Google to create a locally focused version, Concert Local. In 2022, Vox expanded Concert further by launching a supply-side platform (SSP) that will allow Vox to build a direct connection between its Concert ad network and the advertisers it serves by cutting out third-party ad tech intermediaries.

Vox Media has also launched another advertising platform, Forte, which is an ad-targeting platform that relies solely on first-party data (i.e., data obtained from consumers visiting Vox Media digital properties). Forte uses the data it collects to help advertisers better understand whether those consumers are likely to buy something or take action after viewing an ad. Vox Media has positioned Forte as a tool that will enable marketers to move away from relying on third-party data, which has become more difficult to exploit because of a heightened emphasis on privacy.

Another avenue has been its Vox Media Studios entertainment division, which creates premium nonfiction programming, including Vox's *Explained* series on Netflix, Eater's *No Passport Required* series on PBS, and a multiyear deal with Hulu to provide food programming. Vox Media Studios also includes the Vox Media Podcast Network and Epic, a film and TV production company.

In addition, Vox is enlarging its digital media portfolio. In September 2019, it acquired New York Media, which includes the print and digital *New York* magazine, as well as several digital media platforms such as The Cut, Grub Street, Intelligencer, The Strategist, and Vulture. Vox has continued the print version of *New York* magazine but will also focus on developing multiple revenue streams.

However, like just about every other business, Vox Media's plans were upended by the Covid-19 pandemic. Although Vox Media was profitable in 2019, its revenue declined in 2020 because of the dramatic reduction in ad spending. In response to the pandemic, Vox furloughed 9% of its employees (about 100 people) from May 1 to July 31 2020, as well as froze and cut certain salaries. However, it rebounded in 2021, hiring more than 200 people during the course of the year. In December 2021, it announced that it was acquiring Group Nine Media, adding Group Nine's brands Popsugar, The Dodo, Thrillist, Seeker, and NowThis to the Vox Media lineup. The combined company is expected to generate more than $700 million in revenue in 2022 and more than $100 million in profit. The acquisition will also allow Vox to add data from the audiences of Group Nine's brand, increasing the reach of Forte, Vox's first-party data platform.

SOURCES: "Top 50 Multi-Platform Properties (Desktop and Mobile) July 2022," Comscore.com, accessed September 7, 2022; Voxmedia.com, accessed September 7, 2022; "Vox Media Unveils Updates to Its First-Party Data Platform, Forte, Following Acquisition of Group Nine," Voxmedia.com, June 9, 2022; "'Masters of Our Domain': Vox Media Launches Its Own SSP," by Seb Joseph, Digiday.com, June 7, 2022; "A Year of Growth: Vox Media Looks Back on Its Tenth Year," Voxmedia.com, December 30, 2021; "Vox Media Agrees to Buy Group Nine Media, Creating Big Digital Publisher," by Amol Sharma, and Benjamin Mullin, *Wall Street Journal*, December 14, 2021; "Vox Is Revamping Its Editorial Strategy to Redefine What 'Voxxy' Means," by Hanaa Tameez, Niemanlab.org, November 8, 2021; "Vox Media and Google Launch 'Concert Local' Ad Network," by Sara Fischer, Axios.com, March 20, 2020; "Vox Media to Buy *New York* Magazine in VC-Backed Takeover," by Kevin Dowd, Pitchbook.com, September 25, 2019; "In Praise of Vox," by David Leonhardt, *New York Times*, June 26, 2019; "Chorus Platform Officially Open to Premium Digital Publishers," Voxmedia.com, July 17, 2018; "Top Digital Publishers Join Concert to Create the Largest Premium Advertising Marketplace Online," Voxmedia.com, May 31, 2018; "Recirculate! Vox Media's New Structure for Story Packages Gives Readers Context (and Helps Them Stick Around)," by Christine Schmidt, Niemanlab.com, March 26, 2018; "Two Years in, Vox.com Reconsiders Its 'Card Stacks,'" by Lucia Moses, Digiday.com, September 9, 2016; "Vox Media Ventures into General News and News Analysis with Vox.com," by Paul Farhi, *Washington Post*, April 7, 2014; "Vox Takes Melding of Journalism and Technology to a New Level," by Leslie Kaufman, *New York Times*, April 6, 2014; "Ezra Klein Is Joining Vox Media as Web Journalism Asserts Itself," by David Carr, *New York Times*, January 26, 2014.

What online news sites often do not have are credibility and trust. For instance, BuzzFeed has been the subject of many lawsuits accusing it of copying content from competing newspapers and sites without attribution, instead claiming the content as its own. Without trust and credibility, native digital news sites can become distractions filled with celebrity photos, click-bait headlines, and virtually no original reporting.

If the newspaper industry has a future, it will be online and multiplatform. The challenge for newspapers is to create value by focusing on differentiated, timely, and exclusive content that is available nowhere else; to transform its culture of journalism to provide a continuous news stream of content just as its digital-only competitors do; and to make this content available anywhere, anytime, anyplace, and on any device. In short, newspapers will have to become Digital First publications while maintaining their historic quality edge and meeting the challenge from their purely digital competitors. Major print newspapers are focusing on making this transition and increasing their digital subscriptions and digital ad revenues.

MAGAZINES REBOUND ON THE DIGITAL PLATFORM

The Internet and the Web did not have much impact on magazine sales at first, in part because a computer's screen was no match for the high-resolution, large-format pictures found in, say, *Life* or *Time*. However, as computer screens improved, as video on the Web became common, and as the economics of color publishing changed, print magazine circulation began to plummet, and advertisers turned their attention to the online platform, where readers were increasingly getting their news, general-interest journalism, and photographic accounts of events. Magazine newsstand sales have declined significantly since 2001.

Despite the shrinkage of print subscription and newsstand sales in the past few years, some people, especially younger adults, are still reading magazines. According to MPA—The Association of Magazine Media—an estimated 220 million people engage with magazine content via print/digital replica editions, the Web, mobile devices, or video. Magazines have been effective users of social media in part because of their stunning photos and images. Magazines collectively have garnered more than 700 billion "likes" and followers on Facebook and Instagram (MPA—The Association of Magazine Media, 2021). Total U.S. magazine industry revenues were estimated to be around $28 billion in 2021 (Ibisworld, 2022). However, digital ad revenue is making up for only some of the decline in print revenue. One possible solution is charging a subscription fee for access to the digital editions, which currently are often free. Magazine publishers also rely on magazine aggregators like Apple News+, Zinio, Magzter, and Flipboard, which make it possible for customers to find their favorite magazines using a single app. A **magazine aggregator** is a website or app that offers users online subscriptions and sales of many digital magazines.

magazine aggregator a website or app that provides subscriptions and sales of many digital magazines

To survive, magazines must create a unique digital online and mobile version of their print magazine—without at the same time losing their unique brand and quality—and, in most instances, while still maintaining a print presence. For instance, *The New Yorker*, founded in 1925, publishes a mixture of news, culture, short stories, and the arts written by some of the finest and best-known authors, along with cartoons and movie reviews. The magazine undertook a digital remaking following its introduction of a metered paywall in 2014. The digital edition of *The New Yorker* is in continuous

production 24/7, while the print edition continues its deadline-driven 47 annual issues *The New Yorker* has aggressively pursued an online presence on Facebook, Twitter, Instagram, and Pinterest and has created a series of newsletters and blogs. *The New Yorker*'s mobile audience has swelled. Contrary to initial expectations, mobile readers are more likely to read the entirety of long stories on their phones rather than on their desktops. The digital makeover has, therefore, worked: *The New Yorker* routinely has around 20 million unique visitors a month, increasing its readership of the combined print and digital editions to more than 1 million subscribers paying $90 a year. Subscription revenue is now more than 70% of total revenue and is far less fickle than ad revenue. A digital-only subscription costs $60 a year (Silber, 2022; Mullin, 2017; Bilton, 2014). The future of magazines as with newspapers is tied to digital subscription growth.

E-BOOKS AND ONLINE BOOK PUBLISHING

The book publishing industry's experience with the Internet is very different from that of the newspaper and magazine industries. Despite the extraordinarily rapid growth of e-book sales (25% or more annually in the early years), sales of print books and book publishing revenues have remained fairly stable. In 2021, the U.S. book publishing industry generated about $29 billion, a more than 10% increase from the previous year (Anderson, 2022; Association of American Publishers, 2022). Although estimates of e-book revenues (including indie e-books published and sold through various online channels, such as Amazon) vary, some analysts believe that these revenues currently represent around 20% (about $5.8 billion) of the total book publishing revenue (Ebooks.com, 2022). The percentage of U.S. adults who read print books still remains strong, with a recent survey finding that 65% had read a print book in the previous year, compared to about 30% who had read an e-book. Just 9% said that they read books only in a digital format and do not read any print books (Pew Research Center, 2022a).

The first commercially successful e-book was Stephen King's *Riding the Bullet*, a 66-page novella that King made available on Amazon in 2000. At first it was free, and there were 400,000 downloads on the first day, crashing Amazon's servers. Even when the price was raised to $2.50, demand remained brisk. Ten years later, Amanda Hocking, an unknown writer from Austin, Minnesota, uploaded *My Blood Approves*, a novel about vampires, to Amazon's self-publishing site and later to the Barnes & Noble e-book store. The novel had been rejected by many of the publishing houses in New York. Within a year, though, Hocking had sold more than 1 million copies and earned more than $2 million.

In the space of a decade, e-books have brought about a significant change in the processes of writing, selling, and distributing books. They have gone from an experiment by a major author to an everyday experience for millions of readers and a promising new market for authors. An entirely new channel for self-published authors now exists, a channel not controlled by the major publishing companies and their professional editors. However, only a very few indie authors have sold more than 1 million copies of their e-books, and only about a thousand have earned more than $100,000 in royalties (Haysom, 2020). The vast majority of indie authors are unable to make a living solely from e-book sales.

Accounting for independent e-book sales in the mix of total book sales is difficult because most self-published e-books sold on Amazon do not have ISBNs

(International Standard Book Numbers) and, therefore, are not counted by the publishing industry, whose books always have ISBNs. Industry-based reports on e-book sales include only those published with ISBNs. The book distribution market has been greatly changed, and yet it is apparent that the major publishing firms still maintain their positions as significant sources of book content in terms of revenue. In addition, although bookstore chains like Borders and Waldenbooks have disappeared and Barnes & Noble faces significant challenges, the number of small, independent bookstores has grown by almost 50% since 2009. Independent bookstores initially declined from about 4,000 in 2002 to about 1,900 in 2009, largely because of the growth of national bookstore chains like Barnes & Noble and the growth of Amazon's online book sales. But from 2009 to 2018, 570 independent bookstores opened. Prior to the Covid-19 pandemic, the number of independent stores was still growing, with many having successfully transformed their legacy business models and technology to compete with Amazon by sponsoring community events, curating and displaying books, and creating a supportive culture for book lovers, thus demonstrating that in some cases, legacy business models and technologies can adapt to new digital models and technologies (Raffaelli, 2017, 2020). However, the fate of independent bookstores, like that of all small retailers, now remains a major uncertainty in the wake of the pandemic and the current economic climate.

Amazon and Apple: The Digital Media Ecosystems

Although precursors of e-books and e-book readers were introduced in the early 2000s, it was not until 2007 that the future of e-books was firmly established. In that year, Amazon introduced the Kindle, which allowed users to download books from the Kindle store using AT&T's cell network. E-books received another boost in 2009, when Barnes & Noble introduced its Nook e-reader, and in 2010, when Apple introduced its first iPad tablet computer. With its large, high-resolution screen, the iPad was even better for reading e-books. Since its introduction, Amazon has greatly improved its Kindle and also offers its Fire HD tablet, which competes with the iPad. However, the Kindle and the Fire tablet are no longer as central to Amazon's e-book business because Amazon has added Kindle apps for smartphones and other mobile devices.

Today, Amazon is the dominant player in the e-book market, with Apple a distant second. Amazon's Kindle Store and the Apple Books Store both contain millions of titles. The result of the Amazon and Apple ecosystems, which combine hardware, software, and online mega stores, has been an explosion in online book content, readership, authorship, and marketing and at least a partial upending of the traditional book publishing and marketing channels.

The processes of writing and publishing a book have similarly been changed. In the traditional process, authors worked with agents, who sold book manuscripts to editors and publishers, who then sold books through bookstores, at prices determined largely by the publishers. Because bookstores had a vested interest in selling books at a profit, there was only limited discounting and only during clearance sales. In the new publishing model, unknown authors still write books but then bypass traditional agent and publisher channels and instead self-publish digital books that are sold on Amazon or by Apple. Prices are determined by the author and are usually much lower than the prices of traditional books, which depend on the popularity of the author. The digital distributor

takes a percentage of the sale (usually 30%). New self-published authors often give away their early works to develop an audience and then, when an audience appears, they charge a small amount for their books, typically 99 cents to $2.99. Marketing occurs by word of mouth via social networks, author blogs, and public readings. Although only a very few self-published authors have thus far struck it rich, the possibility of doing so has been enough to arouse the passions of thousands of potential writers of the great American novel as well as lesser genres, from police procedurals to paranormal romance novels.

E-book Business Models

The e-book industry is composed of intermediary retailers (both bricks-and-mortar stores and online merchants), traditional publishers, technology developers, device makers (e-readers), and vanity presses (self-publishing service companies). Together, these players have pursued a wide variety of business models and developed many alliances in an effort to move text onto desktop and increasingly mobile screens.

There are five major publishers that dominate trade book, education, and religious book publishing. These traditional publishers have the largest content libraries and produce the majority of new book titles each year. In the e-book marketplace, the major publishers started out using a **wholesale model** of distribution and pricing, in part because this is the same model they used with print books. In this model, the retail store pays a wholesale price for the book and then decides at what price to sell the book to the consumer. The retailer sets the price with, of course, some kind of understanding with the publisher that the book will not be given away for free. In the past, the wholesale price was 50% of the retail price. With e-books, publishers discovered that some online retailers like Amazon and Apple began to sell books below their cost in order to encourage customers to purchase their e-book reader devices or to buy other goods. The real value of e-books for Amazon and Apple is selling digital devices. Amazon not only sold millions of Kindles but also sold 90% of all e-book titles in 2011. Amazon thus had a de facto monopoly on e-books.

wholesale model
prices are determined by retailer

In response, the top five publishers, along with Apple, introduced an **agency model** of distribution in which the distributor is an agent of the publisher and can be directed to sell e-books at the price determined by the publisher, which was around $14.99 or higher for certain titles. In return for a 30% commission, Apple agreed to support this model, as did Google, neither of which was comfortable watching as Amazon dominated one of the hottest areas of online content sales. Amazon's prices rose to around $14.99 as well, and its market share fell to 60%.

agency model
the retailer is an agent, and prices are set by the publisher

However, the Justice Department sued the five publishers and Apple for price fixing, which is in violation of antitrust laws. The case was settled, and Apple paid a fine of $450 million. Amazon and the five publishers ultimately reached an informal detente: Publishers now set their e-book prices, generally at the same or higher prices as their print editions. Amazon discounts print books but not below their wholesale cost. Today, each publisher (and not an industry consortium) makes an agreement with Amazon about the price of their books (the agency model). E-book prices from major publishers are variable but generally are around $15.

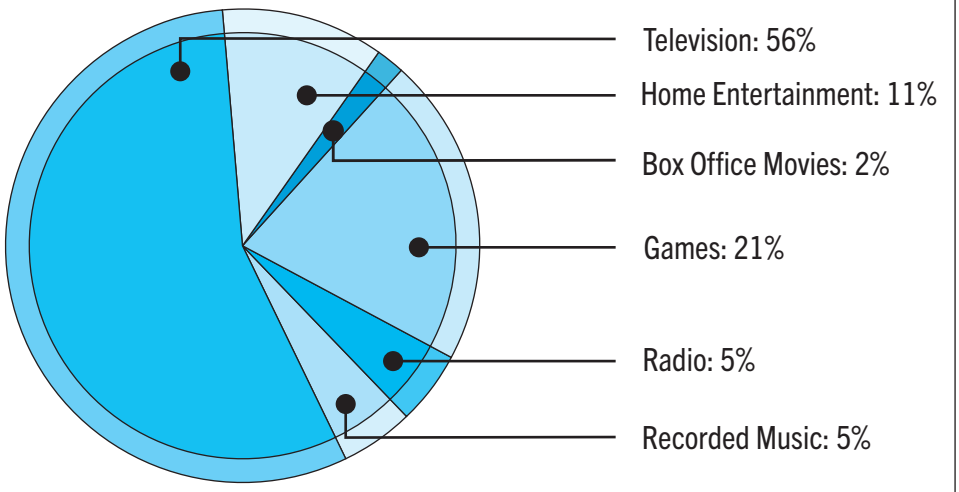
In 2014, Amazon launched Kindle Unlimited, a subscription e-book service. Kindle Unlimited has a catalog of millions of e-books and enables subscribers to borrow 10 books at a time. Although Kindle Unlimited reportedly has about 2 to 3 million

subscribers, the subscription model has not reached the level of success for e-book sales that it has experienced in the music or home entertainment industries. The primary reason is that the five major publishers, which together still account for about 60% of U.S. book sales, have thus far licensed only very limited parts of their catalogs to the service (Rosenblatt, 2020).

10.3 THE ONLINE ENTERTAINMENT INDUSTRY

In this section, we will first take an overall look at the online entertainment industry in general and will then focus more closely on each of the major sectors: television, movies, digital audio (music and podcasts), and games. Together, these entertainment industries generated around $285 billion in U.S. revenue in 2021, which includes both digital- and traditional-format revenues. In recent years, the lines dividing these various industries have begun to blur, particularly in the area of home entertainment, which involves both television and movies. **Figure 10.10** illustrates the relative sizes of the various entertainment industry sectors. The broadcast, cable, and satellite television industry is, by far, the largest, with about $157 billion in revenues generated by advertising and cable and satellite TV fees. Both the television and the movie industries share in home entertainment revenues involving the physical and digital a la carte sale or rental of television episodes and feature-length movies, as well as subscription services (about $32 billion). Box office movies, which continued to be severely impacted by the Covid-19 pandemic in 2021, produced $4.5 billion. The game industry generated about $60 billion from sales of hardware, software, and online games. The music industry is composed of radio and recorded music, which together generated about $29 billion. Recorded music generated

FIGURE 10.10 THE MAJOR PLAYERS IN THE U.S. ENTERTAINMENT INDUSTRY BY REVENUE SHARE



SOURCES: Based on data from industry sources; authors' estimates.

about $15 billion, finally higher than its previous peak of $14 billion in 1999 and was primarily a result of streaming revenues. Radio remains a strong revenue producer, generating about $14 billion, primarily from advertising revenues from FM and AM broadcast technologies. Podcasting revenue currently comprises only a small amount of revenue (about $1.3 billion in 2021), but that amount is expected to grow rapidly over the next several years.

Along with the other content industries, the entertainment industry has undergone a transformation brought about by the Internet, the extraordinary growth of mobile devices, and the very large investments by Big Tech firms in video on-demand subscription services and the development of original content. Several forces are at work here. Mobile devices, coupled with the easy availability of the entertainment content now offered by Apple, Amazon, Netflix, Hulu, and many others, have changed consumer preferences and increased demand for such content, whether in subscription or a la carte, pay-per-view formats. Social networks have also spurred the delivery of entertainment content to desktop and mobile devices and have added video and live video streaming to their services, as well as provided a platform for sharing TV and movie experiences.

Music subscription services like Pandora, Spotify, Apple Music, and Amazon Music have millions of subscribers. Apple and Amazon also provide download music services in which users pay for tracks and albums. Both kinds of services—download and streaming—have demonstrated that millions of consumers are willing to pay reasonable prices for high-quality content, portability, and convenience. The growth in broadband has obviously made possible both wired and wireless delivery of all forms of entertainment over the Internet, potentially displacing cable and broadcast television networks. Closed platforms, like the Kindle and Apple Music, and streaming services like Netflix, also work to reduce the need for DRM. Streaming music and video are inherently more difficult to download to a computer. All of these forces have combined to bring about a transformation in the entertainment industries.

In an ideal world, consumers would be able to watch any movie, listen to any music, watch any TV show, and play any game whenever they want, wherever they want, and using whatever Internet-connected device is convenient. This idealized version of a convergent media world has not quite yet arrived, but clearly this is the direction in which-the Internet-enabled entertainment industry is heading, in part because technology will enable this outcome to be realized but also because of the emergence of very large-scale, integrated-technology media companies like Amazon, Google, Apple, and Netflix. Many analysts believe that the large entertainment media giants of the future will be technology companies that have moved into the production of content, rather than content producers, and will become Internet titans. This transition is already beginning.

When we think of the producers of entertainment in the offline world, we tend to think about television networks such as CBS, NBC, ABC, Fox, HBO, or Showtime; Hollywood film studios such as MGM, Disney, Paramount, and 21st Century Fox; and music labels such as Sony BMG, Atlantic Records, Columbia Records, and Warner Records. Many of these brand names have now established significant entertainment presences on the Internet with their own streaming and on-demand services. Although traditional forms of entertainment such as television shows and Hollywood movies are now commonplace online, neither the television nor film industries have built an industry-wide delivery system. Instead, they are building relationships with tech-based

Internet distributors like Netflix, Google, Amazon, Facebook, and Apple, all of which have become significant players in media distribution and content similar to cable TV networks. The Internet is the new distribution channel.

Refer to Figure 10.4 for a review of the growth of U.S. online entertainment revenues from 2019 to 2024 for the major industries: online games, online TV and movies, and online music. Online game revenues are currently the highest and are expected to continue to be so through 2024. Revenues from online TV and movies are also expected to continue increasing through 2024, although their rate of growth has slowed compared to that in previous years, in part because of the increasing proliferation, as well as the increased cost, of subscription services. Online music revenues from all formats, although much smaller on an absolute basis than online television and movie and game revenue, are also expected to continue to increase through 2024. Overall, the strong growth in online entertainment revenues during this time period, from about $60 billion in 2019 to an estimated $125 billion in 2022—more than doubling during the period—explains why so many firms are focused on the online entertainment market.

HOME ENTERTAINMENT: TELEVISION AND MOVIES

The television and movie home entertainment industry in 2022 remains in the midst of a transition to a new delivery platform—the Internet via smart connected TVs, smartphones, and tablet computers as well as dedicated digital media devices such as Apple TV, Google Chromecast, Amazon Fire TV, and Roku (see **Table 10.3**). Roku is the top digital media device, used by more than 115 million people, followed by Amazon Fire TV, used by about 105 million (Insider Intelligence/eMarketer, 2022f)

TABLE 10.3 DIGITAL MEDIA DEVICES

DEVICE	DESCRIPTION
Apple TV	Provides content from Apple's Apple TV app as well as content from thousands of other channels/apps, including Amazon Prime Video, Netflix, Hulu, HBO, Showtime, etc. Does not provide access to Google Play. Includes touchpad remote control and Siri voice recognition.
Google Chromecast	Streams content from Google Play store as well as from other providers such as Amazon Prime, Netflix, Hulu, HBO, ESPN, YouTube, and thousands of others. Must have account that provides access to these services. Does not provide direct access to Apple TV. Unlike other devices with on-screen interfaces that display channels/apps that can be selected and played via use of a remote controller, with Chromecast you find the content you want on the Chrome browser or mobile device and then "cast" it to your TV via the Chromecast player. Lowest-cost device.
Amazon Fire TV	Tightly integrated with Amazon Prime, provides access to Amazon's original content and to thousands of other content providers, now also including Apple TV. Google Play content can be accessed via YouTube app. Comes in two basic models: set-top box (Fire TV) and Fire TV stick.
Roku	Streams content from more than 3,000 channels/apps, including Netflix, Amazon Prime Video, Apple TV, Google Play, HBO, etc. Must have account that provides access to these services. Various models available, which are differentiated by performance, features, and price, ranging from set-top box to streaming stick.

over-the-top (OTT) services
offer consumers access to television shows and full-length feature movies using Internet service rather than cable or satellite TV service

In the past, the dominant way consumers obtained a TV signal was via over-the-air broadcasters, cable TV, and satellite distributors. Today, alternative **"over-the-top" (OTT) services**, which offer consumers access to television shows and full-length feature movies using Internet service rather than cable or satellite TV service, have been developed and led by powerful technology companies such as Apple, Google, Amazon, Hulu, Netflix, and others. OTT services include the ability to download content after purchase or rental, as well as subscription streaming and "live" TV services (see **Table 10.4**).

As a result, as discussed in the chapter-opening case, the cable/satellite TV distribution model has been challenged. This transition follows an earlier but related transition to DVRs and time shifting by consumers, who no longer want to be constrained by television executives' programming and scheduling decisions. The ability to conveniently download television programming and feature-length movies from distributors such as Apple TV and Amazon Prime Video, as well as from streaming subscription services provided by Netflix, Amazon, Apple TV, Hulu, and others, provides a significant alternative to traditional cable/satellite television delivery systems. OTT services offer unbundled, a la carte access: Consumers do not have to purchase a bundle of channels, most of which they never watch. Nor must TV watching be linear. Watching a TV series in linear fashion as it is aired over an entire season is increasingly being supplanted by binge watching, in which all available episodes of a series are viewed over a relatively short period of time. OTT distributors like Netflix, Amazon, Apple TV, and Hulu are gaining market power vis-à-vis TV and movie production firms, and cable/satellite television delivery systems are losing ground.

Although the number of U.S. households watching pay TV via cable/satellite systems is declining (down from a high of about 100 million to about 70 million in 2022), the big TV screen in the home is still as popular as ever, supported by social networks that buzz with chatter about what's on TV right now and by Internet-connected smart TVs. In 2022, about 65% of the U.S. population (about 220 million people) uses an OTT subscription service in addition to or instead of cable/satellite TV, and this percentage is expected to increase to nearly 70% (about 240 million people) by 2026 (eMarketer, Inc., 2022c).

The new platform is changing how, when, and where consumers watch TV. The term "home entertainment" has become somewhat of a misnomer, as viewing has expanded beyond the home. The best screen when commuting or traveling is the smartphone or tablet screen. Cloud computing has shifted the focus away from ownership of content to access to content anywhere, anytime, and from any device as a streaming service. Streaming has replaced downloading as the preferred consumer viewing platform, with subscription streaming services expanding more rapidly than the purchase and downloading of content.

The Internet and the mobile platform have also changed the viewing experience. In the past, television was often a social event involving family and friends in the same room watching a single TV show. Today, the social circle has expanded to include friends in different locations, co-viewing shows and texting, commenting, and chatting online while the show unfolds, thus changing television from a "lean back and enjoy" experience to a "lean forward and engage" experience. The most important activity in today's television household may not be what's on screen but instead what's being said about what's on screen.

In Hollywood, the transition to a digital delivery platform is well underway, with the industry poised to maintain its revenue stream. As consumers have become fully connected to broadband networks on mobile, desktop, and home TVs, Hollywood has responded with

TABLE 10.4 MAJOR OVER-THE-TOP (OTT) SERVICES

TYPE OF SERVICE	DESCRIPTION
PURCHASE/RENT AND DOWNLOAD	
Apple TV	In addition to Apple TV+ subscription video on demand (SVOD) service, also offers more than 30,000 movies and 6,500+ TV shows for purchase/rent. Purchase options for television shows include single-episode, season, season pass, and multi-pass.
Amazon Prime Video	In addition to SVOD service, also offers option to purchase or rent thousands of movies and TV episodes, a la carte or with a season pass.
SUBSCRIPTION VIDEO-ON-DEMAND (SVOD) SERVICES	
Netflix	Thousands of movies and TV series along with original programming; has announced plans to launch an ad-supported tier in November 2022.
Amazon Prime Video	Thousands of movies and TV episodes along with original programming; (free for Amazon Prime subscribers; available for $8.99/month for non-Prime subscribers), includes some ads for original content; more than 100 premium channels (HBO, Showtime, Starz) also available for additional charge.
Hulu	TV series from broadcast and cable networks; new and classic movies; original programming; ad and ad-free plans available.
Apple TV+	Launched in November 2019. Original movies and TV series. No ads.
BROADCAST/CABLE SVOD SERVICES	
Paramount+	Live CBS TV channels (news, sports, events) plus more than 30,000 movies and episodes of CBS programming on demand; both ad-free and ad-supported plans available.
Discovery+/HBOMax	TV series, movies, documentaries, and other original programming; no ads.
Showtime Anytime	Live and on-demand access to Showtime programming, no ads.
Disney+	Launched in November 2019. Movies and TV series, including original content, from Disney-owned brands such as Pixar, Marvel, Lucasfilm, and National Geographic. Has announced plans to launch ad-supported tier in December 2022.
"LIVE"/ON-DEMAND OTT SERVICES	
Sling TV	Offered by Dish Network (satellite provider). Between 30 and 50 live TV channels (from national, regional, and local broadcast and cable networks), plus more than 40,000 on-demand titles. Includes ads.
DirecTV Stream (formerly AT&T TV Now)	Offered by AT&T. More than 140 live TV channels, plus more than 40,000 on-demand titles. Includes ads.
Hulu with Live TV	More than 75 channels of live content, including sports, news, current episodes of TV shows, and on-demand movies, TV, and original programming. Includes ads.
YouTube TV	Between 85 and 100 live TV channels, depending on location, including regional sports and cable networks; some original programming; also available on-demand. Includes ads.

a host of alternative viewing options. As a result, consumer spending on movie entertainment has been stable, with significant growth on digital platforms. Of all the content industries, the home entertainment and movie industries have been best able to maintain their revenue streams and not be digitally destroyed by new technologies, at least for now.

The key to the success of Hollywood studios in the digital era is their control over original, full-length feature production and their control over who will distribute their movies and when and how. As Big Tech firms pour billions into content creation, Hollywood and New York studios are reaping a windfall in production money. Distributors—whether Internet providers or cable systems—have had to meet the terms of Hollywood studios.

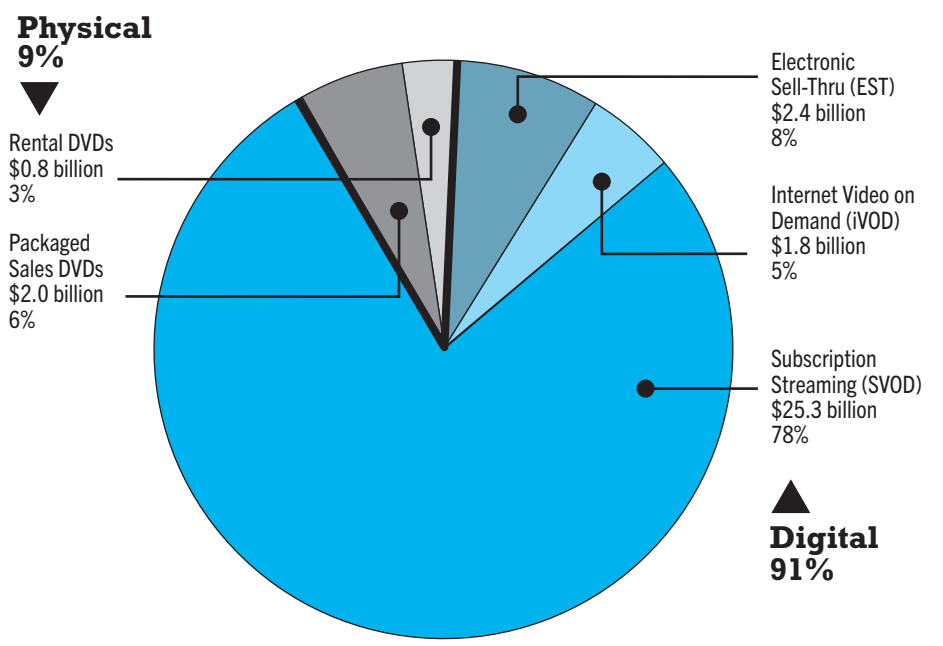
Electronic Sell-Through (EST) (download to own) selling movies online for download and ownership

Internet Video on Demand (iVOD) selling access to specific movies a la carte on cable TV and over the Internet

Subscription Video on Demand (SVOD) subscription streaming over the Internet

Aside from box office theater revenues, the movie industry derives revenue from both physical formats (DVDs) and digital formats. Revenue from physical formats (sale and rental of DVDs) has declined significantly since 2006 and in 2021, was just $2.8 billion, constituting only 9% of home entertainment revenues. However, the decline in DVD revenues has been offset by the stunning growth of digital formats, which include selling movies for download (called **Electronic Sell-Through (EST)** or **download to own**), selling access on cable or the Internet to specific movies a la carte (called **Internet Video on Demand (iVOD)**), and especially selling access via subscription streaming over the Internet (called **Subscription Video on Demand (SVOD)**), which took in more than $25 billion in U.S. revenue in 2021, up almost 20% from the previous year (see **Figure 10.11**).

FIGURE 10.11 U.S. HOME ENTERTAINMENT REVENUE BY FORMAT



Physical formats (sales and rentals of DVDs) now make up only 9% of home entertainment revenue. Revenue from digital formats, particularly subscription streaming, is growing at a much higher rate and now accounts for more than 90% of the home entertainment market.

SOURCE: Based on data from Insider Intelligence/eMarketer, 2022g.

Each of these digital formats has a leading player. Apple is the EST download leader. Consumers purchase and own the downloaded movie. Apple is also the leader in iVOD a la carte rentals, but other major players include Amazon, Hulu, and cable systems, which also rent movies on demand. Subscription streaming (SVOD) has grown more quickly and is much larger than iVOD. Netflix is the leading subscription streaming service in terms of subscription revenue and the time spent using the service. Amazon Prime Video and Hulu are prime competitors, as are Apple TV+ and Disney+, both of which launched in November 2019. Other competitors of significant size include premium cable television networks such as HBO, Showtime, and Discovery+; broadcast networks such as CBS's Paramount+ and NBCUniversal's Peacock. More new competitors are on the way. One concern is that the number of potential options will overwhelm consumers. A recent survey found that 55% of those surveyed said that there are too many streaming options, and a similar percentage felt that it is getting too expensive to pay for all the content they would like to watch. Only 16% said that they would be willing to spend more than $60 per month on video streaming services; more than 40% were willing to pay only $30 a month or less (Caporal, 2022).

Hollywood faces a number of challenges as well as it tries to keep up with a rapidly changing distribution platform, which is increasingly digital, streaming, and mobile. The fastest-growing digital streaming format does not produce much revenue on a per-unit basis. This means that the studios are under pressure to keep their new movies in digital theater display or video downloads and to use the streaming channels (such as Netflix and Amazon Prime) for older movies that have already been seen by millions of customers or that might not sell at any price without the Internet (i.e., as part of the Long Tail, as discussed in Chapter 6). Hollywood achieves this market segmentation by controlling the **release window** of movies, staggering their market release. Doing so is a form of price discrimination: Those who really want to see the movie as soon as possible are willing to pay a higher price. The first tier is the theater box office, followed by DVDs, cable video-on-demand, Internet video-on-demand, and finally subscription streaming services. However, the release window is changing under pressure from consumers to release films earlier to streaming and VOD services. For instance, in 2020, Universal Pictures and AMC, the world's largest theater chain, came to a new agreement to shorten the theatrical release window to just 17 days (it had previously been two and a half months) for movies released by Universal and that play at AMC theaters. Although the change was somewhat academic given the widespread closure of movie theaters because of the Covid-19 pandemic, it represented a significant shift (Watson, 2020). Release windows still remain an issue, however. In 2021, actress Scarlett Johansson sued Disney, claiming that it had breached her contract by releasing the movie *Black Window* on Disney+ the same day that the movie premiered in movie theaters. Similarly, in 2022, the co-producer of *The Matrix Resurrections* sued Warner Brothers, claiming that the decision to release the movie simultaneously on HBO Max and in theaters violated its contract (Flint, 2022; Walsh, 2021).

release window
staging the release of new movies across different distribution channels with different prices

A second challenge involves the growing strength of online movie distributors, which may become competitors. Prior to the Internet, distributors such as movie theater chains and DVD rental and sales stores were never in a position to create their own movies and enter the movie production business. But in the digital era, distributors like Netflix, Amazon, Hulu, and Apple have the financial strength to make feature-length movies and

reduce their significant licensing costs. Firms based on streaming are incentivized to produce their own content to avoid the steep licensing fees demanded by Hollywood studios.

Although the emergence of multiple, legitimate sources for streaming and downloading movies in a convenient and safe manner appears to have reduced the overall amount of piracy, piracy still remains a threat to the movie and television industries, despite years of effort by the industry and the government to reduce piracy. In the past, bit torrents and cyberlockers/file-hosting sites (like Megaupload) were the most common methods of piracy, but today, sites that offer streaming of pirated content have become much more popular.

The monetary amount that the movie industry loses as a result of piracy is unknown. A recent study estimated that global online piracy costs the U.S. economy at least $29 billion in lost revenue each year. Services like Netflix and Apple TV+ that permit access to streams of movies for a small monthly fee or downloaded rentals for a few dollars, have arguably reduced the motivation of many potential pirates to pirate movies. However, the Covid-19 pandemic reversed the downward trend, at least in the short term, and research firms that track piracy trends noticed a significant uptick in traffic to pirate websites. Research by security firm Akamai illustrates the continuing prevalence of piracy. During a six-month period in 2021, it detected more than 130 billion visits to piracy websites (with the United States the leading location of visitors, with 13.5 billion visits) and 3.7 billion unlicensed streams and downloads of movies and television shows (Akamai, 2022; Uberti, 2020).

AUDIO ENTERTAINMENT: MUSIC AND PODCASTS

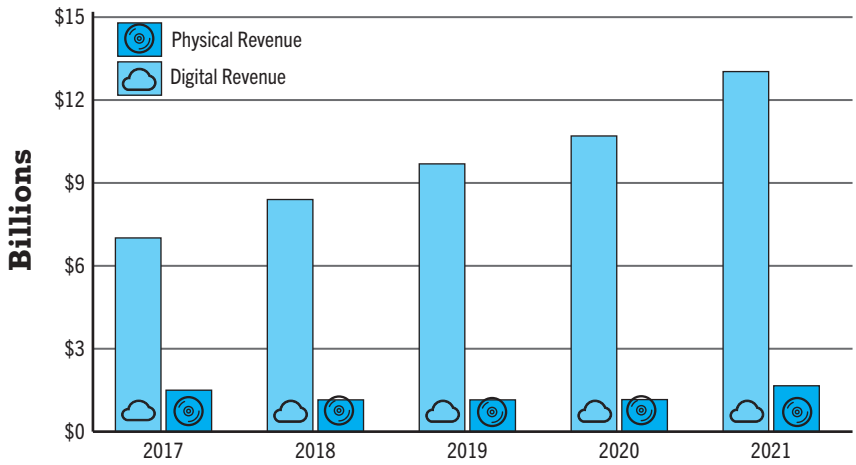
Audio entertainment has traditionally been focused on music, which is delivered via either a live or a recorded performance. Recorded performances can be transmitted via radio broadcast, in a physical format (a traditional physical record or CD), and via the Internet. Podcasts are a newer form of audio entertainment focusing on the spoken work, typically in the form of a discussion about a particular topic or current event or a story delivered in episodes. About 25% of the time that U.S. adults spend with digital audio is spent listening to podcasts.

Music

In 1999, the recorded music industry hit a high point, with an estimated $14 billion in revenue, but then slid precipitously down through the years, to a low of $6.7 billion in 2015. The fall was caused by the decline in CD sales and the growth of much less costly digital downloads (EST), both legal (Apple's iTunes) and illegal (piracy). The situation began to change in 2016 with the explosion of streaming music subscription services, and revenues began to grow for the first time in more than a decade. In 2021, the industry generated about $15 billion in revenues, finally topping its previous high point back in 1999. It has taken more than 20 years for the industry to recover from the disruption rained down upon it by the arrival of the Internet. Although illegal, pirated file sharing and downloading of music were the leading edge of a digital tide that initially deeply disrupted the music industry, first legal digital downloads and then streaming services have put a damper on illegal music piracy. Legal digital music sources have saved the recorded music industry by generating solid revenues and profits, albeit not as generous as they were in the heyday of CDs.

In 2021, digital revenues constituted 87% of all U.S. music revenues (about $13 billion) (see **Figure 10.12**). Revenues from physical sources (about $1.7 billion) accounted

FIGURE 10.12 U.S. MUSIC REVENUES: DIGITAL VERSUS PHYSICAL



Music industry revenues fell drastically between 1999 and 2015. However, revenues began to grow again in 2016 because of the rise of streaming services. Revenue from digital sources now constitutes more than 85% of all U.S. music revenues.

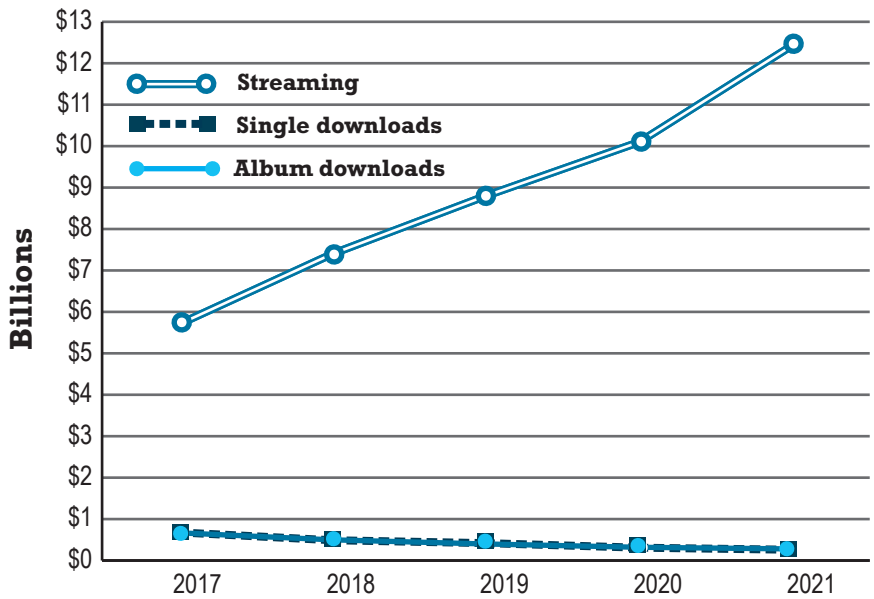
SOURCES: Based on data from Recording Industry Association of America (RIAA), 2019, 2020, 2021.

for about 11% of the industry's revenue. Streaming music sales from ad-supported streaming and subscription streaming sites totaled $12.4 billion, or about 83% of industry revenue, whereas revenue from digital downloads constituted only about 4%. What originally started as digital destruction is finally starting to look like a digital resuscitation (Recording Industry Association of America (RIAA), 2022).

For most of its history, the music industry depended on a variety of physical media to distribute music—acetate records, vinyl recordings, cassette tapes, and finally CDs. At the core of its revenue was a physical product. Since the 1950s, that physical product was an album—a collection of bundled songs that sold for a much higher price than singles did. The Internet changed all that when, in 2000, a music service called Napster begin distributing pirated music tracks over the Internet to consumers who used their PCs as record players. Despite the collapse of Napster because of legal challenges, hundreds of other illegal sites showed up, resulting in music industry revenues falling from $14 billion in 1999 to around $6.7 billion in 2015. Beginning in 2001, the appearance of powerful mobile media players that could be connected to the Internet—like Apple's iPod and, later, the iPhone and iPad and then the stunning growth of music streaming sites—further eroded sales of CD albums. Streaming has fundamentally altered the sale of physical music formats as well as digital downloads because it is no longer necessary for consumers to "own" a physical or digital unit in order to hear the music they want.

The music industry initially resisted the development of legal digital channels of distribution but ultimately and reluctantly struck deals with Apple's new iTunes Store in 2003, as well as with several small subscription music services, for online distribution. By the time streaming music services appeared on the scene in 2006, the music industry had dropped its opposition to digital formats and quickly reached agreements with Pandora,

FIGURE 10.13 U.S. DIGITAL MUSIC REVENUES BY FORMAT



Streaming music has grown to be the largest source of digital music revenues, reaching more than $12 billion. In contrast, downloads of singles and albums collectively account for only around $500 million.
SOURCES: Based on data from Recording Industry Association of America (RIAA), 2019, 2020, 2021.

Spotify, and others to stream music on their subscription and "free" ad-supported services in return for fees. At that time, digital downloads of tracks and albums and fees from streaming music services were widely perceived as the saviors of the music industry, which was losing sales to piracy and file sharing. Nevertheless, revenues from these sources initially paled in comparison to the revenues that used to be produced by the sale of CD albums. **Figure 10.13** shows consumer spending on digital music in three different formats: singles, albums, and streaming music.

There are two primary kinds of digital music services, each with a different business model: digital download and streaming music services. Digital download services (also known as download to own) are provided by Apple, Amazon, and Google and enable users to download tracks and albums a la carte and pay a fee for each song. Increasingly, the songs are stored on a cloud server so that users can listen to the music from any of several personal devices. All revenue derives from the sale of albums or single tracks. At their high point, in 2012, digital downloads comprised 43% of industry revenue. However, today, digital downloads have been almost totally eclipsed by streaming music. Digital downloads generated only about $590 million in 2021, a 12% decline from 2020 and now represent only about 4% of the industry's revenue. In 2021, the revenue from digital downloads was surpassed by even the revenue from the sale of physical units.

Streaming music services (sometimes also referred to as Internet radio) like Pandora (now owned by Sirius XM), Spotify, Apple Music, Amazon Music Unlimited, Google Play Music (which merged with YouTube Music in 2019), and Tidal shift the concept of owning

music to the ability to access music from any device, anywhere, and at any time. Music is typically not stored on user devices but is instead delivered to listeners from cloud servers (although some services also offer download/digital locker service). Pandora offers a curated service that allows users to select an artist they want to listen to, and then the service uses an algorithm to create a list of artists similar to the artist selected by the user. However, users do not control what they hear and cannot repeat a selection. Spotify allows users to specify artists and songs.

Streaming music services have two revenue streams: ad-supported and subscription service. Ad-supported streaming is a freemium model that allows users access to free streamed music for a limited number of hours per month and relies on advertising to generate revenue. Streaming music services also typically offer a subscription option, which enables users to listen to ad-free music for a monthly fee. However, typically only a small percentage of listeners pay a subscription fee, and ad revenues typically exceed subscription revenues by a substantial margin. Apple Music does not offer free music and requires a monthly subscription fee of $10 for ad-free streaming.

In the United States, there were around 85 million paid streaming music subscriptions in 2021, an 11% increase from 2020, and many more millions listen on a freemium basis (Recording Industry Association of America [RIAA], 2021). However, although music streaming services have been accumulating listeners at a torrid pace, few services have managed to earn a profit because of infrastructure costs, the costs of acquiring music content from the music labels, and the freemium revenue models supported by advertising revenues. Streaming services offered by Big Tech companies like Apple, Amazon, and Google can afford to offer these services at a loss because these services create new customers for the companies' physical devices, operating systems, and other services. As a result, it is unclear whether independent streaming music services have a viable business model.

Spotify, with about 400 million active users worldwide at the end of 2021, exemplifies the difficulties of the music streaming business model. Spotify makes nearly all its revenue from its 189 million subscribers, who pay a monthly subscription fee (Spotify, 2022). Although its revenue increased by almost 20% in 2021 to €8.5 billion, its payments to record companies, artists, and distribution costs rose at about the same rate. These payments to content owners are likely to increase in the future as the record companies and artists negotiate better distribution agreements and as a result of the Music Modernization Act passed in 2018, which is further described in the next paragraph. In 2021, although Spotify was able to record an operating profit, it still ended the year with an overall loss. The company claims that its business will eventually scale and become consistently profitable with a larger audience, but this seems to defy business logic. Nevertheless, investors see upside opportunity in Spotify because of its audience of millions of Millennials and Gen Z-ers and its petabyte-size database on user behavior.

One of the issues surrounding streaming music is the compensation of artists and music labels for content. Although music labels might receive 32 cents for every iTunes track they sell, they receive only 0.63 of a penny on a streamed version of the same song. This revenue is split with the artists, who receive 0.32 of a penny. *Rolling Stone* calculated that a very popular song selling 1 million streams would produce revenue of $3,166 for the artist and a similar amount for the music label. For artists, ad-supported streaming pays considerably less than subscription streaming. For this reason, many artists and groups refuse to allow free ad-supported streaming of their music, and there is a growing movement among musicians toward seeking higher compensation from streaming sites. Streaming services

have responded by increasing their payouts to musicians for subscription-based streaming, and in 2018, Congress passed the Music Modernization Act (MMA), aimed specifically at rectifying these issues. The MMA enables songwriters and artists to receive royalties on songs recorded before 1972, creates a legal process for music professionals to obtain the unclaimed royalties due to them (previously these royalties were held onto by the streaming services), and creates a licensing database paid for by the streaming services but overseen by music publishers and songwriters that should streamline how songwriters are paid, all of which should help ensure that artists are paid more and have an easier time collecting the royalties they are owed (Deahl, 2018).

Podcasts

The term *podcast* originated as a mashup of the words "iPod" and "broadcast." As previously noted, a podcast is a digital audio presentation that can be downloaded from the Internet, stored on a desktop/laptop computer or on a mobile device, and listened to at the listener's convenience. Podcasting has transitioned from being primarily user-generated content produced by amateur producers to a professional talk content–distribution industry. The podcast *Serial*, distributed by National Public Radio (NPR) in 2014 and with 300 million downloads, is credited with introducing podcasts to the mainstream public. Today, more than one-third of the U.S. population (about 125 million people) listen to podcasts monthly. Gen Z and Millennials currently account for almost 60% of all podcast listeners.

Spotify, Apple Podcasts, Google Podcasts, Amazon Music, and iHeartMedia are among the most popular platforms for the delivery of podcasts. YouTube is now making its presence known with the launch of a dedicated podcasting page. Twitter is incorporating podcasts into its platform, on its Spaces tab. Other players in the industry include Audible, which views podcasts as a natural extension of the audio books market that it already dominates, and Internet radio network Sirius XM. Many news organizations such as the BBC, the *New York Times*, Vox Media, and National Public Radio also host podcasts on their individual websites. As can be seen from this list, companies whose primary focus is other forms of entertainment, such as music (Spotify, Amazon Music, iHeart Media, and Sirius XM), video (YouTube), books (Audible), news (the BBC and the *New York Times*), and social media (Twitter), are all jumping onto the podcast bandwagon.

The podcast industry is supported primarily by advertising, with total ad revenues in 2021 reaching about $1.3 million. Those revenues are expected to almost triple, to more than $3 billion, by 2026 (Insider Intelligence/eMarketer, 2022h).

GAMES

The online game industry is an astounding success story, growing from $6 billion in 2012 to more than $60 billion in 2021, with spending on video game content (including purchases of games via download or subscription and in-app spending on virtual goods) generating about $52 billion of that total (Entertainment Software Association [ESA], 2022). Video game revenues are larger than revenues derived from any other form of online entertainment. Smartphones have driven most of this growth because they enable games to be played anywhere and anytime and do not require bulky equipment, consoles, or an extended engagement of time. For instance, Pokémon GO is a GPS-based application for Apple iOS and Android smartphones that overlays exotic monsters on the phone's screen (see **Figure 10.14**). The aim is to locate, capture, and train these characters. Users are rewarded

FIGURE 10.14 POKÉMON GO

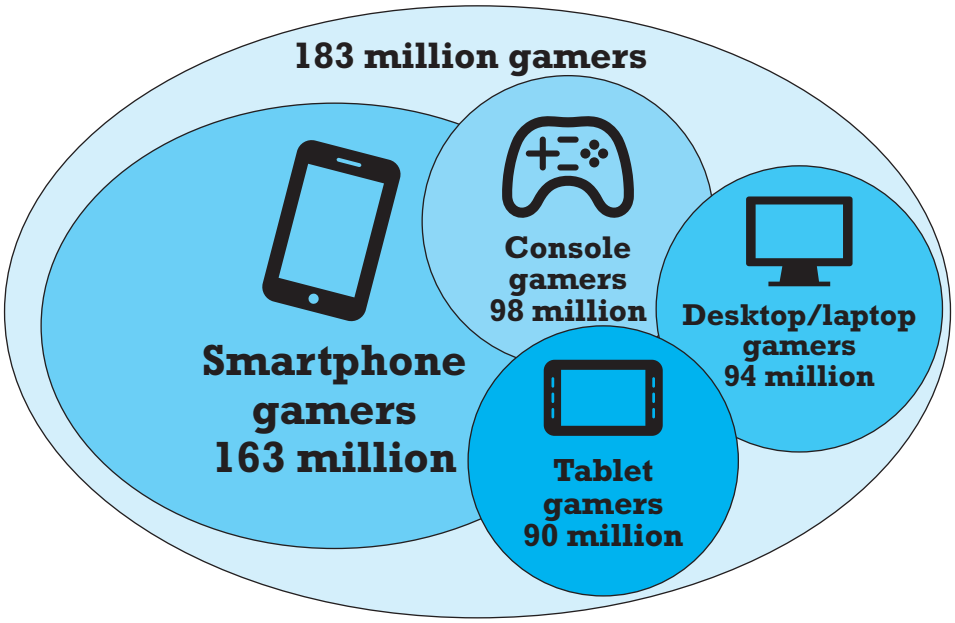
The augmented reality game Pokémon GO took the world by storm when it was first released.
© Matthew Corley /Shutterstock

with stardust (virtual currency). In one month, Pokémon GO became the most popular app download on iTunes and Google Play. In two months, Pokémon GO had 200 million players worldwide and had generated more than $300 million in revenue. Since its release, Pokémon Go has been downloaded more than 675 million times worldwide and has generated more than $6 billion in revenue, which is more than $1 billion per year, since its launch in July 2016 (SensorTower, 2022). Pokémon GO provides an example of how the online gaming world is changing from its initial focus on console and PC desktop gaming.

There are different types of digital gamers, who often overlap the various categories. PC gamers play games on a desktop or laptop computer. They are often called casual gamers because they play games for a few minutes at a time, stop and start games, and are not intensively involved. Social gamers are those who play games using a web browser or app on a social network like Facebook, often with friends. Mobile gamers play games using their smartphones or tablet computers. Mobile gamers are casual gamers as well and have fleeting involvement. Massively multiplayer online (MMO) gamers use their computers to play with a large number of players around the globe. Console gamers play games online (or offline) using a dedicated console like Xbox, PlayStation, or Wii. Often, console gamers are connected via the Internet to enable group play and conversations.

Console gaming used to be the heart of the digital gaming industry, and it still is, from a revenue perspective. But this changed rapidly with the introduction of smartphones and tablets, as well as social and casual gaming, which do not require users to purchase an expensive console or packaged software. Smartphones and tablets have ushered in an era of free-to-play and $1.99 game apps and much simpler game scenarios that do not require millions of investment dollars to develop. In 2022, about 183 million U.S. Internet users play some kind of game online. More than 162 million people play games on smartphones, and about 90 million play games on tablets. Slightly more people (about 97 million) play games on game consoles than on desktop/laptops

FIGURE 10.15 U.S. ONLINE GAMING AUDIENCE, 2022



The mobile platform (smartphones and tablets) has become the preferred platform for the majority of gamers.
SOURCES: Based on data from Insider Intelligence/eMarketer, 2022e.

(about 95 million). In reality, gamers often use all of these platforms at different times (see **Figure 10.15**) (Insider Intelligence/eMarketer, 2022e).

In the United States, revenue from digital games (not including hardware) in all formats (mobile, PC-based, massive multiplayer, social, and console) in 2021 was estimated at about $50 billion (not including the sale of hardware) (ESA, 2022). To put this in perspective, in 2021, revenues derived from digital games (about $50 million) were more than 50% larger than those generated by online movies and television (about $32 billion).

The rapid growth in the number of people playing mobile games based on tablets and smartphones is a sea change for the gaming industry, which was previously dominated by closed-platform console games and hardware firms like Microsoft, Nintendo, and Sony and by software firms like Activision and Electronic Arts. The growth of smartphones, tablets, and mobile games has catapulted Apple's App Store and the Google Play store into being the leading merchants of digital games, which, of course, use Apple and Google Android hardware and software. Apple and Google take 30% of game sales and also benefit from the sales of the hardware and software needed to play the games. Mobile games appeal to a younger demographic, offer lower prices, and initially are often free. You can play mobile games anywhere you can use a phone, which is nearly everywhere. In contrast, console games take much longer to develop, have very large budgets, and are expensive to purchase.

The mobile platform is a more open platform that allows thousands of developers to create entertaining games on much smaller budgets as well as new and innovative

games on a faster schedule. In contrast, the console platform has evolved much more slowly than mobile computing. Sony PlayStation and Microsoft Xbox consoles have five- to six-year development cycles. Although console, PC, and online social games will continue to grow their audience size slowly, the fastest audience growth in the future will be in mobile games that can be played anywhere and anytime.

Digital gaming is likely to get an additional boost in association with the further development of the metaverse (see Chapter 3). Many of the augmented reality and virtual reality tools and technologies being developed to make the metaverse possible are already being deployed in conjunction with immersive digital games. For instance, right now, in Meta's Quest VR ecosystem, most of the applications are games. The ideas of being able to jump into different worlds, be represented by a personalized avatar, interact virtually with other users, and purchase virtual items using virtual currencies have all been pioneered in the video game environment (Insider Intelligence/eMarketer, 2022i).

Another stimulus to PC and mobile game revenue growth is the emergence of professional gaming, otherwise known as e-sports. E-sports, like other professional sports, is based on organized competitions of prominent video games and resemble major sporting events. The competition at the championship level takes place in auditoriums attended by thousands of fans and is watched by millions more on the Internet. Worldwide, the e-sports audience was estimated to be more than 530 million in 2022, split relatively evenly between 270 million occasional viewers and 260 million enthusiasts (Insider Intelligence/eMarketer, 2022j). The largest e-sports tournament in 2021 was the Dota 2 International Championship, with a prize pool of more than $40 million. Dota 2 is an online multiplayer battle game played by two teams of five players each. E-sports tournaments now routinely draw an online audience equal to that of professional football games. In 2021, about 74 million peak concurrent viewers watched the League of Legends world championship, which took place in Reykjavik, Iceland (Gough, 2022). The games are broadcast over cable television channels but are more commonly broadcast over Internet channels such as Twitch, which is owned by Amazon. For more information on Twitch, see the *Insight on Technology* case, *Game On: Twitch*. Other popular e-sports channels include YouTube Gaming and Microsoft's Mixer.

The organization of the tournaments, and the prize money for the players, are provided by the games' publishers and advertisers. The leading publisher of digital games played at professional levels is Riot Games, publisher of League of Legends (LoL), a multiplayer online battle game. There are 20 professional League of Legends teams that compete with one another. The league requires teams to hire professional video game coaches. Other multiplayer games suited to arena play include StarCraft II and Call of Duty. These games are all multiplayer online battle arena games (MOBA).

Advertisers are attracted to e-sports because the audience is predominantly composed of young males between the ages of 21 and 34, who are difficult to reach using traditional media. Coca Cola, Nissan, Ford, and Google are among the largest sponsors of e-sports. College teams have sprung up across the country, including at Harvard and Princeton, and many colleges now offer scholarships for students who will play on their e-sports team. NBA basketball teams are building complexes to support both regular games and e-sport teams. At current rates of growth, e-sports are in the process of transforming online gaming into a popular sport that is similar to fantasy football but has a much larger audience.

INSIGHT ON TECHNOLOGY

GAME ON: TWITCH

During the Covid-19 pandemic, which canceled live sports, concerts, and other public forms of entertainment, online streaming platforms like Twitch picked up the slack, allowing viewers to watch every conceivable type of competitive gaming as well as an increasingly diverse array of other types of content, including online concerts, talk shows, and more. The pandemic boosted Twitch's viewership statistics across the board and has helped to shift consumers' content consumption habits toward live streaming.

Twitch was originally founded as Justin.tv, a site consisting of one channel, which featured its founder, Justin Kan, wearing a camera and streaming every moment of his life online. Justin.tv began to feature other streamers with their own channels, and in 2010, the company spun off its increasingly popular gaming section into a separate entity called Twitch. Amazon bought Twitch for $970 million in 2014, and Twitch has grown to become the dominant livestreaming platform today, with about a 75% market share of daily active users of mobile livestreaming apps in 2022. In the second quarter of 2022, Twitch also led in terms of hours watched (5.64 billion, representing a 94% market share of hours streamed) and unique channels (9.6 million). Twitch had an average of about 2.5 million concurrent viewers watching content on Twitch at any given moment during 2021, a number that surpasses even the number of viewers of television channels as prominent as ESPN and cable news. Twitch has a global audience, with 22% of Twitch traffic originating from the United States and with large audiences in Germany, South Korea, and France as well.

Twitch faces competition primarily from Google's YouTube Gaming. Microsoft had attempted to make inroads into the market with its Mixer livestreaming platform, but it proved unsuccessful. Similarly, in August 2022, Facebook began notifying some of its partners that it would be shutting down its mobile game streaming apps in October 2022, although it said it would continue to support game streaming within Facebook itself. However, looming on the horizon is TikTok, which is testing desktop livestreaming software that will enable users to stream standard camera videos as well as videos captured from games and other programs. Viewers will be able to watch from the TikTok mobile app or their desktop browser. Netflix is also reportedly in the early stages of exploring livestreaming.

Twitch rose to prominence by focusing on video gaming, with an emphasis on e-sports, which, as previously mentioned, are organized competitions of prominent video games that resemble major sporting events. E-sports is a $1.4 billion global industry and a growing component of the even-larger gaming industry as a whole, which is estimated at about $190 billion globally. Competitions in popular games such as League of Legends, Fortnite, and Call of Duty regularly record tens to hundreds of thousands of concurrent viewers. In 2019, Twitch launched its Esports Directory, a separate heading that displays all of the live e-sports competitions happening at that moment as well as highlights and recaps of past competitions.

For the largest individual Twitch streamers, the growth of the platform has led to eye-popping success. Fortnite streamer Tyler "Ninja" Blevins, for years the most successful Twitch streamer in terms of viewership, reportedly earned as much as $10 million per year on Twitch. Twitch streamers have a variety of ways to earn money, including advertising revenue

from ads that automatically play on their channels, subscriptions that allow loyal viewers to receive extra perks and features from the channel, and tips in Twitch's digital currency, "bits." A major security breach at Twitch in October 2021 revealed that 81 streamers had been paid at least $1 million by Twitch in 2019. Although some popular Twitch streamers at one point jumped ship to other platforms, most have now returned to the Twitch fold. However, competition remains an issue. The most recent streamer to leave Twitch for YouTube Gaming is DrLupo, who had 1.7 million Twitch followers, which is much less than his 4.5 million YouTube followers. In an effort to stem the flow, Twitch will now allow its exclusive creators to also livestream on YouTube Live and on Facebook Live, as long as they don't do so while they are simultaneously on Twitch.

With Amazon as its parent company, Twitch does not have to be too overly concerned about generating profits. Its revenue derives primarily from advertising. However, the advent of legalized sports gambling in the United States presents another potential revenue stream for Twitch. Amazon could also potentially begin selling Twitch's streaming technology the same way it sells Amazon Web Services products to other companies. Another possibility is for Amazon to integrate Twitch into its Amazon Prime services so that even if Twitch does not generate substantial revenues on its own, Twitch could contribute to the Amazon ecosystem by generating new Prime subscriptions or increasing engagement with the Amazon Prime program.

But despite its market leadership, Twitch faces a number of problematic issues. Twitch, like other livestreaming platforms, has struggled to curb violent livestreams. For instance, the May 2022 Buffalo, New York, supermarket shooting was livestreamed by the gunman on the Twitch platform. Although the livestream was taken down less than two minutes after it began, the video had already made its way to other platforms. The Buffalo attack has added to complaints about how Twitch has handled harassment on its platform. Twitch's audience consists of more than 80% White males, and harassment of women, people of color, and streamers who are LGBTQ+ has been a difficult problem for the company to solve. Many prominent female streamers have indicated that harassment is their biggest issue with Twitch. To tackle this problem, Twitch appointed an eight-person Safety Advisory Council consisting of Twitch creators and outside experts to help guide the company through issues of harassment and content moderation. Twitch also rebranded its icon and began to promote itself with a new, inclusive slogan: "You're already one of us." Twitch also released its Twitch Studio app, which is designed to help novice streamers who aren't technologically savvy set up their own streams. Only time will tell whether Twitch can make good on its efforts at inclusivity.

SOURCES: "Facebook Gaming Is Going the Way of Microsoft's Mixer, with Its Apps Slated to Shut Down," by Jez Corden, Windowscentral.com, August 31, 2022; "Twitch Waves the White Flag, Will Allow Its Exclusive Creators to Livestream on Other Platforms," by Jeremy Goldman, Insider Intelligence/eMarketer, August 25, 2022; "Concurrent Viewers on Twitch Q2 2022," by J. Clement, Statista.com, August 12, 2022; Twitch Growth Statistics Report 2021," Amraandelma.com, August 10, 2022; "Streamlabs and Stream Hatchet Q2 2022 Live Streaming Report," by Ethan May, Streamlabs.com, August 9, 2022; "Global Video Games Market Expected to Fall for First Time since 2015," by Chris Morris, Fortune.com, July 5, 2022;"Twitch Commands 73% of Mobile Usage among Top Live Streaming Platforms," Sensortower.com, May 2022; "TI Creator Economy: A Mass Shooting Streamed on Twitch Renews Calls for Social Media Controls," by Kaya Yurieff, Theinformation.com, May 16, 2022; "2022 Global Esports & Live Streaming Market Report," Newzoo.com, April 19, 2022; "TikTok Wants to Take on Twitch with New Desktop Livestreaming Software," by Nina Goetzen, Insider Intelligence/eMarketer, December 17, 2021; "Twitch Suffers Massive Security Breach, Raising Questions about Its Market Size," by Daniel Konstantinovic, Insider Intelligence/eMarketer, October 7, 2021; "The Power of Amazon," Insider Intelligence/eMarketer, September 9, 2021; "Amazon Might Offer Twitch's Streaming Technology to Businesses," by Nathan Ingraham, Engadget.com, February 6, 2020; "The Future of Live-Streaming, for Better or Worse, Depends on Twitch," by Amrita Khalid, Qz.com, November 12, 2019; "Gamers Paved the Road for a Streaming Future. Twitch Wants to Add More Lanes," by Gene Park, *Washington Post*, October 3, 2019; "Twitch Is Rebranding for the First Time, and It Has a Logo for Everyone," by Mark Wilson, Fastcompany.com, September 26, 2019; "Why Amazon's Twitch, Facebook and Tech Giants Want Live Sports," by Thomas Barrabi, Foxbusiness.com, September 6, 2019.

10.4 CREATORS AND USER-GENERATED CONTENT

We conclude our discussion of online media and content with a quick look into the world of user-generated content (UGC), creators, and the creator economy. We first introduced UCG, creators, and the creator economy in Chapter 1. UGC has been a part of the online experience almost since the beginning of the Web and has been an integral part of the Web 2.0 movement and the development of social media. What's changed over the last 10 years or so has been the notion that creators own the content they create and should be able to monetize it for their own behalf rather than solely for the behalf of the platforms that distribute the content.

There is a myriad of different types of UGC, crossing into all of the online content and media industries discussed in previous sections. Print content (newspapers, magazines, and books), video (short form and long form), digital audio (music and podcasts), and games all now have UCG alternatives, as do some forms of content that we have not discussed, such as art and photography.

As you learned in Chapter 1, there are a number of ways that creators can earn money based on the content they create. They can be supported by advertising, either directly from a brand for creating or sharing sponsored content or featuring a product placement, or from a share of the advertising earned by the platform on which their content appears. They can also sell digital content, either on a per-piece basis or on a subscription basis, as well as physical products. Non-fungible tokens (NFTs), which can be used to create unique digital assets such as collectibles, artwork, badges, and stickers, are a newer form of digital content that creators are beginning to use as rewards for their fans. Creators can also get "tips" from their fans (often characterized as "buying the creator a coffee"), money from a fan club or via a donation platform, or other types of fan engagement. Some creators offer online courses, either on their own platform or on a third-party site, or offer a livestream or other online event for a fee. Most creators use a variety of these income-generating methods rather than relying on just one.

There are a variety of platforms available that are specifically dedicated to allowing creators to directly monetize the content they create. YouTube is perhaps the best known. YouTube compensates creators on its platform based on the advertising revenue generated by the ads that YouTube runs alongside the content: Creators receive 55% of the ad revenues generated during their long-form videos. In addition to ad revenue, eligible YouTube creators can receive tips from viewers, along with revenue from other tipping features like Super Chat (which are paid highlighted messages in a chat stream) and Super Stickers (which are paid stickers in livestreams). YouTube introduced a new feature, YouTube Shorts (videos of 60 seconds or less), in September 2020 in an effort to combat TikTok's popularity. Although currently there is no direct creator revenue from ads shown in conjunction with Shorts, YouTube has established a $100 million Shorts Fund that will award bonus payments to well-performing Shorts creators (Singer, 2021). Spotter is a creator economy company that provides direct payments to content producers in exchange for creators' licensing of their old content. In September 2022, Spotter announced that it had paid $600 million to YouTube creators to date (Spotter, 2022).

Patreon is a membership platform that helps creators get paid for their efforts. Creators use the platform to distribute content, and in exchange, their followers and

fans (patrons) use the platform to financially support creators. Top content categories include video and film, podcasts, music, games, writing, drawing and painting, photos, and comics. Creators on Patreon that use its subscription features have earned $3.5 billion through the end of 2021 (Yurieff, 2022). Substack provides a platform that allows journalists and other writers to monetize their content on a subscription basis via e-mail newsletters. In 2021, according to Substack, the top 10 writers on its platform made $20 million, collectively (Fischer, 2021).

Roblox is an online game platform that allows users not only to play games but also to create games using Roblox's proprietary tool, Roblox Studio. Users can create virtual items that other users can purchase. In 2021, Roblox paid out more than $535 million to creators on its platform and as of June 2022, had 12 million creators. Twitch, discussed in the previous section, is also a major platform for creators involved with gaming.

Finally, social network platforms that initially relied on the free use of UCG are now bowing to pressure and developing "Creator Funds." In 2021, Meta announced that it planned to invest $1 billion by the end of 2022 in programs to give creators new ways to earn money for the content they create on Facebook and Instagram. The program includes bonus programs that pay eligible creators for hitting certain milestones when they use Meta's creative and monetization tools. In October 2021, Meta announced a special $10 million Creator Fund to encourage creators to build experiences in Horizon Worlds, its social VR platform. Meta is also expanding the options available to creators on Instagram so that they can make money and interact with followers using a pilot of Instagram Subscriptions, which will allow creators to hide posts and videos behind a paywall. Subscriptions can range from 99 cents to $99 per month, with pricing determined by the creator. TikTok has also expanded its creator monetization options beyond its $200 million Creator Fund with a tipping feature that it added in December 2021 and with a new program called TikTok Pulse, announced in May 2022, that will run ads alongside videos on the app and give creators a 50% cut of ad revenue. However, the program is limited to just the top 4% of all videos, which means that ad revenues will go only to creators who already have an established presence on the platform. Most of the other major social networks, such as Snap, Pinterest, and LinkedIn, have also launched Creator Funds. However, despite the increased focus by social networks on funding for creators, a recent survey has found that only a very small percentage of creators (fewer than 10%) have received more than $5,000 from a social network creator fund, with almost 50% of those surveyed receiving between $0 and $500 (Insider Intelligence/eMarketer, 2022k).

10.5 CAREERS IN E-COMMERCE

A wide array of jobs is available in the set of related, yet diverse industries that comprise online content and media. Jobs may involve the creation of content and/or the production of content, with the type of content ranging from newspapers to magazines to books and to television, movies, videos, music, and games, all in a variety of different forms and formats. In addition to e-commerce and other digital technology courses, coursework in communications, journalism, English and humanities, as well as courses in the creative fields, all provide relevant background for careers in online content and

media. In addition to creative ability and skills, technical skills in digital media production, as well as business skills in product management and program management will also prove useful.

THE COMPANY

The company is a publishing and digital media company that started out as a single newspaper in Pennsylvania in the nineteenth century. The firm began using the Web to support its content distribution in 2006. Today, the company's operations include four daily newspapers, more than a dozen non-daily publications, and more than 100 digital sites that focus on niche audiences in sports, news, and finance.

POSITION: DIGITAL AUDIENCE DEVELOPMENT SPECIALIST

You will be working in the Media Division to develop and launch several new websites that will focus on regional cuisines, entertainment, products, and lifestyles. The digital content of these sites includes articles, photos, video, and audio. Content will be distributed on the websites as well as via e-mail and social networks. The main objective is to build an audience and create an engaged community of followers. Your responsibilities will include:

- Managing distribution of content across Web, social, and mobile platforms.
- Working with team members to develop a strategy that increases audience size.
- Developing experiments to test alternative media effectiveness.
- Extracting and analyzing data from a number of tools to develop an understanding of the relationship between strategy and performance.
- Developing recommendations to help drive content and audience.
- Developing new digital content and ideas that will propel audience growth.
- Rewriting, repackaging, and optimizing content from other company sites.
- Identifying new audiences and content expansion opportunities.
- Measuring performance to achieve revenue targets.
- Producing short- and long-form video, photo, and text content.

QUALIFICATIONS/SKILLS

- Bachelor's degree in journalism, communications, marketing, public relations, advertising, e-commerce, social media, or a related media field
- Experience using the major social networks (Facebook, Twitter, lnstagram, and LinkedIn) as well as familiarity with alternative social media platforms such as TikTok and Reddit
- Knowledge of digital journalism, video, and photo content
- Demonstrated ability to collaborate with individuals and groups
- Experience creating content for a website
- Knowledge about the latest digital and industry trends
- Video production skills and experience
- Understanding of the audience behavior of each major social platform
- Familiarity with project management tools

PREPARING FOR THE INTERVIEW

Begin by doing background research on the firm's services, markets, and business strategy. What makes this firm unique, who are its competitors, and what is its position in the marketplace? Then review Section 10.2 on the online publishing industry, especially the material on the emergence of native digital news and content sites. Also review the *Insight on Society* case on Gen Z and the *Insight on Business* case on Vox. All of this material will help make you conversant about trends in the digital publishing industry. Also make sure that you understand what a position involving digital audience development involves. You should additionally familiarize yourself with the capabilities of Google Analytics and research Moz (SEO training and tools), CrowdTangle (web publishing content management and social media monitoring), and Skyword (content marketing software and services). Finally, be prepared to talk about how you use social networks and your experiences creating content for websites or blogs, including photo and video production.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. Tell us about some of the industry trends that you think will have an impact on our digital publishing business within the next few years.

To answer this question, you can draw on the material in Section 10.2. First, you might suggest that digital publishing and print publishing are merging into a single business model producing news articles and features like videos and rich media 24/7. The major industry trends are the decline of print advertising, the rapid growth of digital advertising, the growth of social media as one of the major sources of readers, the movement of the audience to mobile devices, the need to refocus the publishing team so that it works in both digital and print media, and the growth of a digital-first business model. The key to newspaper survival is having a large audience that is growing online and quality content that draws readers to the paper's sites and for which readers are willing to pay.

2. What can we do to attract Millennials and Gen Z-ers to our content?

You will want to point out that Millennials and Gen Z-ers are both different from and similar to older adults: They have grown up in a technology-rich, digital environment and use technology to consume content in different ways than do members of older demographics. They are attracted to social media, video content, lifestyle content, and interactive online products, and they are more likely to consume content on mobile devices. They like to share content with friends via social networks. That said, Millennials, for instance, read as many as or more news articles and books than their parents and are typically more educated. The firm would do well to develop content for both print and digital distribution and, in the online editions, to increase the use of videos, rich media, and interactive content that can be easily accessed.

3. How can we use social media to get users to engage with our content?

You can start by noting that the firm needs to place a major emphasis on reaching the connected social network audiences on Facebook, Twitter, and niche social networks that focus on specific areas of life, from sports to crafts and to television shows in which

audience engagement is very high. You can point out that social media is nearly equal to news organizations as a source of online news. The firm should also be making use of the marketing tools available on social media like newsfeeds, promoted posts, videos, and very precise marketing to targeted groups. Think about the features you particularly like on social networks as one way to demonstrate your social media interests and activities that the firm might learn from.

4. What can we learn from the experience of Vox Media?

You can answer this question by talking about the many new "native" digital publishers like Buzzfeed, Huffington Post, and, of course, Vox. Collectively, these sites attract well more than 100 million monthly visitors. You should have researched these sites prior to the interview, and based on your research, you can talk about what makes the content and presentation of these sites different from what appears in traditional online and offline newspapers. Native digital publishers have some unique ways of presenting news and articles: There are more short stories, catchy headlines, user-generated content, videos, and photos. You should also point out that many, if not all, of these native digital sites have had difficulty securing high-quality content, paying for staff, and generating enough advertising revenue to be self-sustaining.

5. What tools would you suggest we use to enhance the effectiveness of our content?

To answer this question, you can draw on the research on various tools that you should have done prior to the interview. For instance, CrowdTangle is a tool that publishers can use to track how their content spreads across the Web. Skywood is a content marketing software and services tool that provides access to a community of thousands of creative freelancers. Moz is a content marketing tool that is focused on search engine optimization.

10.6 CASE STUDY

Netflix:
How Does This Movie End?

The Emmys are the television industry's annual awards, the equivalent of the movie industry's Academy Awards. The Emmys provide insight into who's winning and losing in TV land. In 2021, Netflix garnered 129 Emmy nominations, just one fewer than its content rival, HBO, which reaped 130 nominations. In the final awards contest, Netflix won more Emmys than did any other network or platform for the first time ever, grabbing 44 awards, which was more than double the number won by HBO and HBO Max. In 2022, Netflix continued its Emmy success, receiving 105 nominations and racking up 26 wins. Netflix has also joined the Oscars club, receiving 116 nominations for Academy Awards in 24 different categories, including seven nominations for Best Picture over the last several years, and winning 16 Oscars.

Netflix is a non-cable alternative to cable TV. By producing its own content, Netflix is able to attract subscribers looking for new shows, not retreads from the cable networks. However, original productions are much more expensive to produce than is licensing existing content. And there are plenty of other streaming services with very large budgets, among them Amazon, Apple, and Hulu, not to mention content powerhouse Disney.

Although Netflix initially did not release the number of viewers of any of its titles, it now releases rankings in terms of how many hours a title is watched. At the top of the list as of August 2022 is the first season of *Squid Game*, which was watched for 1.65 billion hours, followed not far behind by Season 4 of *Stranger Things*, which racked up 1.35 billion hours. Netflix executives credit shows such as these with driving Netflix

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to more than 220 million worldwide subscribers by the end of the second quarter of 2022 (with about 73 million subscribers in North America, accounting for about 33% of its subscribers). Not surprisingly, its number of subscribers spiked in 2020 because of the Covid-19 pandemic, but since then, growth in the number of subscribers has slowed considerably, especially in the United States, where its market penetration is high. In 2022, for the first time, Netflix actually lost subscribers for two successive quarters. Netflix's shares were $15 a share when it went public in 2002 and, at one point in 2021, reached a high of more than $700 a share; but in 2022, the stock price has spiraled downward, and as of September 2022, it is trading at around $230 a share.

Netflix is one of those Silicon Valley stories that might make a good movie, starting out as a dream-come-true story of accomplishment, pluck, innovation, and Internet technology but then taking a darker, surprising turn. Founded by two Silicon Valley entrepreneurs, Marc Randolph and Reed Hastings, in 1997 Netflix got its start as a mail order company renting DVDs of older Hollywood movie titles, delivering them to customers by postal mail. In 2000, it switched to a subscription model in which customers could receive DVDs on a regular basis for a monthly fee. By 2006, it had delivered its billionth DVD and become the largest subscription provider of DVDs. In 2007, Netflix began a video-on-demand streaming service of movies, although it still retained a DVD subscription business. In a few short years Netflix had created the largest DVD rental business in the country and then it created the largest streaming video service.

Along the way, Netflix created the largest database on consumer video preferences and built a recommendation system that encourages consumers to see more movies. Initially, Netflix was primarily a technology company. It developed its own proprietary video-encoding system and distributes its videos using Amazon Web Services and edge computing to ensure high speed and quality delivery. Netflix discovered that older TV series had strong niche followings and built a new model of "binge watching" in which consumers could watch all the episodes of a series in several sittings. Netflix then entered the content creation business by developing original TV series. For this reason, Netflix is an example of convergence in the media industry in which an Internet company becomes a media content producer. Other digital-only media companies took notice and began to develop their own streaming services, but they initially lacked a database of viewer preferences like the one that Netflix has developed over a 20-year period and that helps Netflix make recommendations to subscribers.

In the movie and TV business, there are only two ways to make money: own either the content or the pipelines that deliver the content. It is even better if you can do both. Netflix has become recognized as an important pipeline to a very large audience. For instance, Netflix has struck deals with some Hollywood movie producers to become the exclusive subscription TV home studio for their content. This put Netflix in the same league as premium channel distributors and in direct competition with other cable networks like HBO, Starz, Showtime, and A&E for the rights to show movies after their theater run is complete.

The outcome of this movie depends on how well Netflix can deal with some considerable challenges that have been lurking for some time but that have recently become starkly apparent. For starters, Netflix's content costs are very high, both for older series and movies that Netflix licenses as well as for new original content, which is far riskier. For instance, Netflix had streaming content obligations to content producers in the amount of $23 billion in 2021 alone. Netflix barely makes any profit on the content it

must purchase. Netflix is also in a constant bidding war with both cable and Internet giants all looking for the same thing—popular TV series with a built-in or potential audience. But content owners have wised up to the value of their backlist TV series and have raised their prices accordingly. Series just a year old are very expensive or not available. Netflix is paying hundreds of millions to license hit shows and movies.

As a result of content owners charging more for older cable shows, Netflix has taken the riskier option of developing its own original series. But this is very expensive as well. The critically acclaimed *House of Cards* cost Netflix $100 million for 26 episodes, about $4 million an episode. Newer series are even more expensive to make. For example, *The Crown* cost Netflix $1 billion for seven seasons. In 2021, Netflix spent about $17.5 billion on content alone, and it reportedly will spend a similar amount in 2022. Content is very costly and is becoming more so as new entrants compete for the same talent.

A second challenge Netflix faces is the risk associated with creating new original content. It's not as if wealthy Silicon Valley entrepreneurs can fly to Hollywood or New York with lots of cash and simply purchase new content. Silicon Valley is generally not the place to go if you're looking for storytellers, writers, producers, directors, talent agents, and cinematographers. Algorithms don't come up with new ideas for novels, plays, movies, or TV series, and they have not proven to be good at guessing which series will succeed in the future. Older series are proven series, and Netflix can identify which of its customers watched the series in previous years and can then estimate the audience size and whether new subscribers will be attracted by the replays. But when it comes to new content, Netflix has tried, with mixed results, to use its algorithms to predict what new series its customers might be interested in. Netflix has produced some real winners, according to critics, but it has also produced some losers that did not get critical acclaim. The only technology company that previously has been successful with content production for movies or television is Pixar, which pioneered computer-generated, animated, feature-length movies.

Competition is a third challenge. Although Netflix stands out as a powerful Internet brand today, it has many powerful competitors. Netflix does not have unique technology. In fact, streaming technology is widespread. The success of Netflix's streaming model has attracted tech companies such as Amazon, Apple, and Google, content producers such as Disney and HBO, as well as network broadcast companies. Some of these firms have their own competitive advantages, such as very large Internet audiences, strong brand names, and a good understanding of what their millions of online customers want. For instance, Apple is the leader in downloaded movies, where customers purchase or rent movies, and, of course, Apple owns the world's largest online media store for the purchase of music, videos, and TV series. HBO, founded in 1972, is the oldest and most successful pay television service in the United States and the originator of a long list of highly successful, original TV series and movies. If Netflix has a direct competitor on the creative front, it is HBO, a more traditional programmer that does not use computer algorithms to design its content but instead relies on the hunches and talents of producers and directors to produce its content. And Amazon is, of course, Amazon, which has a long history of dominating most of the markets that it decides to enter.

Many of Netflix's competitors have very deep pockets. This means that Netflix also has competitors for talent and the production of new content and, perhaps, price

pressure as well. Not surprisingly, Amazon has emerged as one of the biggest competitors to Netflix's streaming services. For instance, Amazon offers free streaming to its 160 million Amazon Prime customers. Amazon has also moved into original series production and has won many Emmy awards. Apple and Amazon have far larger databases of subscribers and their preferences than Netflix has.

Despite these challenges, entering 2022, Netflix had become, and remained the largest player in the SVOD services market. But . . . cue the scary music: Things started to go awry. Although subscriber numbers rapidly increased in 2020 because of the Covid-19 pandemic, growth began to slow in 2021 as people began to spend more time outside their homes. In early 2022, Netflix announced a price increase, its third in three years, making its top tier 42% more expensive than it had been in 2018. Netflix could be accused of failing to look in the rear-view mirror. Cable lost much of its market by becoming so expensive that people began to re-evaluate whether they needed it, especially when less expensive streaming services became available. Now Netflix was making the same mistake and in a similar scenario: There are plenty of alternatives to Netflix, almost all less expensive, including Amazon Prime Video, Hulu, Disney+, Apple TV+, Peacock, Discovery+, and a host of niche offerings. And, unbeknownst to Netflix, inflationary pressures and economic uncertainty were about to smack consumers in the United States. In April 2022, Netflix announced a drop in the number of its paid subscribers. Wall Street reacted with horror, with investors bolting for the exit doors, and Netflix's stock price dropped like a ton of bricks, its share price falling to nearly 70% lower than its high near $700 just several months earlier. The Silicon Valley company that had dragged Hollywood kicking and screaming into the streaming age was getting its comeuppance. Netflix was suddenly teetering on the edge of a cliff, and it has been forced to take some drastic steps that it hopes will enable it to claw its way back.

For years, Netflix had avoided the idea of an advertising-based revenue model, even as other major players jumped into the streaming market by offering a combination of premium and less expensive, ad-supported plans. But in April 2022, Netflix's CEO, Reed Hastings, in a ground-shaking strategic shift, announced that Netflix would explore adding a new advertising-backed plan in the coming months. In another surprising move, it selected Microsoft as its ad technology partner, in part because Microsoft, unlike some other potential providers such as Google or Comcast, does not compete with Netflix. The movie is far from over, however. Netflix could end up cannibalizing a big chunk of its current customer base if subscribers decide to opt for the less expensive plan. Netflix is also trying to reign in its spending on content, another difficult task, and one that might also backfire if Netflix is not able to provide the type of content that its viewers want to see. Netflix may have created a new world of streaming, bingeing, and content production, but it may not be able to survive the world it created. This show is not over until the last episode is finished. Stay tuned.

SOURCES: "Netflix's 15 Most-Streamed Series of All Time," by Fay Watson, Gamesrader.com, August 9, 2022; "Netflix Loses Nearly 1 Million Subscribers, Vows Rebound," by Sarah Krouse, *Wall Street Journal*, July 19, 2022; "Netflix Partners with Microsoft for New Advertising-Backed Option," by Sarah Krouse and Suzanne Vranica, *Wall Street Journal*, July 13, 2022; "Despite Netflix's Stumble, Hollywood's Content Spend May Increase in Near-Term," by Caitlin Huston, Hollywoodreporter.com, April 28, 2022; "Netflix Becomes a Not-So-Fast Follower," by Dan Gallagher, *Wall Street Journal*, April 24, 2022; "The Briefing: Netflix's Reed Hastings Bows to Advertising Reality," by Martin Peers, Theinformation.com, April 19, 2022; "Netflix Inc. Form 10-K for the fiscal year ended December 31, 2022," Sec.gov, January 27, 2022; "The Briefing: What Netflix Risks with Its Latest Price Hike," by Martin Peers, Theinformation.com, January 14, 2022; "Netflix Wins Most Emmys for First Time Ever, 'The Crown' and 'Queen's Gambit' Top 2021 Award Haul," by Joe Otterson, Variety.com, September 19, 2021; "Disney Unveils New Streaming Services, to End Netflix Deal," by Erich Schwartzel and Joe Flint, *Wall Street Journal*, August 8, 2017; "Netflix Is Winning the Streaming Race—But for How Long?" by Mathew Ingram, *Fortune*, March 10, 2017; "Netflix Stock History: What You Need to Know," by Dan Caplinger, Fool.com, July 11, 2016; "Can Netflix Survive the New World It Created?" by Joe Nocera, *New York Times*, June 16, 2016; "Amazon Challenges Netflix by Opening Prime to Monthly Subscribers," by Nick Wingfield, *New York Times*, April 17, 2016.

Case Study Questions

1. What are three challenges that Netflix faces?
2. What are the key elements of Netflix's strategy today?
3. Why is Netflix in competition with Apple, Amazon, HBO, and Google, and what strengths does Netflix bring to the market?

10.7 REVIEW

KEY CONCEPTS

■ Understand the major trends in the consumption of media and online content, the major revenue models for digital content delivery, digital rights management, and the concept of media convergence.

- Major trends in the consumption of media and online content include the following:
  - The average U.S. adult spends more than 4,800 hours per year consuming various media. The most hours are spent online, using a desktop or mobile device, followed by watching television and listening to the radio.
  - Although several studies indicate that time spent on the Internet reduces consumer time available for other media, recent data reveals a more complex picture, as Internet users multitask and consume more media of all types than do non-Internet users.
  - In terms of all media revenue, the television and movie industry accounted for about 54% of media revenues; print media (books, newspapers, and magazines) for about 21.5%; video games for about 16.7%; and music (radio and recorded music) for about 8%.
  - The three major revenue models for digital content delivery are the subscription, a la carte, and advertising-supported (free and freemium) models.
  - In terms of paid online content, online games generate the most revenue, followed by online TV and movies.
  - Digital rights management (DRM) refers to the combination of technical and legal means for protecting digital content from reproduction without permission. Walled gardens are a kind of DRM that restricts the widespread sharing of content.
- The concept of media convergence has three dimensions:
  - Technological convergence, which refers to the development of hybrid devices that enable the delivery of various types of media, such as printed content, video, audio, and games, via a single device.
  - Content convergence, with respect to content design, production, and distribution.
  - Industry convergence, which refers to the merger of media enterprises into powerful, synergistic combinations that can cross-market content on many different platforms and create works that use multiple platforms.
  - In the early years of e-commerce, many believed that media convergence would occur quickly. However, many early efforts failed, and new efforts are just now appearing.

■ Understand the key factors affecting the online publishing industry.

- Key factors affecting online newspapers include:
  - *Audience size and growth.* Although the newspaper industry as a whole is the most troubled part of the publishing industry, online readership of newspapers is growing, fueled by smartphones, e-readers, and tablet computers.
  - *Revenue models and results.* Online newspapers predominantly rely on both advertising and subscription revenues. Digital ad revenues are not sufficient to cover losses in print advertising.
- Key factors affecting online magazines include:
  - *Online audience and growth.* Digital magazine sales have soared.
  - *Magazine aggregation.* Magazine aggregators (websites or apps) offer users online subscriptions and sales of many digital magazines.

- Key factors affecting e-books and online book publishing include:
  - *Audience size and growth*. E-book sales growth has leveled off following an explosive growth period. Growth today is fueled by the Amazon Kindle, Apple iPad, and smartphones. The mobile platform of smartphones and tablets has made millions of books available online at a lower price than print books. The future of the book will be digital, although printed books are unlikely to disappear in the foreseeable future.
  - *Competing business models.* E-book business models include the wholesale model and the agency model.
  - *Convergence.* The publishing industry is making steady progress toward media convergence. Newly authored e-books are appearing with interactive rich media, which allows the user to click on icons for videos or other material and take notes.

■ Understand the key factors affecting the online entertainment industry.

- The main players in the entertainment sector are the television and movie, digital audio (music and podcasts), and game industries. The entertainment segment is currently undergoing great change, brought about by the Internet and the mobile platform. Consumers have begun to accept paying for content and also to expect to be able to access online entertainment from any device at any time.
- Key factors include the following:
  - *Audience size and growth.* The audience for all types of online entertainment is growing dramatically.
  - *The emergence of streaming services and the mobile platform.* A major trend in the television, movie, and music industries is the move to streaming services.
  - The greatest growth is anticipated in online gaming, particularly mobile gaming and e-sports.

■ Understand how creators are attempting to monetize user-generated content.

- There are a myriad of different types of user-generated content (UGC), crossing into all of the online content and media industries, including print content (newspapers, magazines, and books), video (short form and long form), digital audio (music and podcasts), games, art, and photography.
- There are a number of ways that creators can earn money based on the content they create, such as advertising, sales of digital content, funding based on fan engagement, or fee-based offerings.
- There are a variety of platforms available specifically dedicated to allowing creators to directly monetize the content they create, including YouTube, Patreon, Substack, and Roblox. Social network platforms that initially relied on the free use of UCG are also now developing Creator Funds to give creators ways to earn money for the content they create on their platforms.

QUESTIONS

1. What are the three dimensions in which the term “convergence” has been applied? What does each of these areas of convergence entail?
2. What are the basic revenue models for online content, and what is their major challenge?
3. What are the two primary e-book business models?
4. What effect is the growth of tablet computing having on online entertainment and content?
5. What techniques do music subscription services use to enforce DRM?
6. What type of convergence does the Apple iPad represent?
7. What are the three different business models that newspapers have used to try to adapt to the Internet?
8. What are the different revenue models that newspapers have used?
9. What advantages do purely digital news sites have over print newspapers? What advantages do traditional newspapers have over such sites?
10. How has the book publishing industry’s experience with the Internet differed from the newspaper and magazine industries’ experience?

11. How has the Internet changed the packaging, distribution, marketing, and sale of traditional music tracks?
12. How has streaming technology impacted the television industry?
13. Why is the growth of cloud storage services important to the growth of mobile content delivery?
14. Has the average consumer become more receptive to advertising-supported Internet content? What developments support this?
15. What factors are needed to support successfully charging the consumer for online content?
16. Why are apps helping the newspaper and magazine industries even though websites failed to help them?
17. What alternatives do magazine publishers have for online distribution channels?
18. Why did the Justice Department sue major publishing firms and Apple?
19. How will the Music Modernization Act impact the streaming music industry?
20. How are mobile devices transforming the gaming industry?

PROJECTS

1. Research the issue of media convergence in the newspaper industry. Do you believe that convergence will be good for the practice of journalism? Develop a reasoned argument on either side of the issue and write a three- to five-page report on the topic. Include in your discussion the barriers to convergence and whether these barriers should be eased.

2. Go to Amazon and explore the different digital media products that are available. For each kind of digital media product, describe how Amazon's presence has altered the industry that creates, produces, and distributes this content. Prepare a presentation to convey your findings to the class.

3. Identify three online sources of content that exemplify one of the three digital content revenue models (subscription, a la carte, and advertising-supported) discussed in the chapter. Describe how each site works and how it generates revenue. Describe how each site provides value to the consumer. Which type of revenue model do you prefer, and why?

4. Identify a popular online magazine that also has an offline subscription or newsstand edition. What advantages (and disadvantages) does the online edition have when compared to the offline, physical edition? Has technology platform, content design, or industry structure convergence occurred in the online magazine industry? Prepare a short report discussing this issue.

5. In 2014, as discussed in the *Insight on Technology* case, Amazon purchased Twitch, which lets users stream their video game sessions, for almost $1 billion. Why would Amazon spend so much money on Twitch? Create a short presentation either defending the purchase or explaining why you think it was a bad idea.

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CHAPTER 11

Social Networks, Auctions, and Portals

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

11.1 Describe the different types of social networks and online communities and their business models.

11.2 Describe the major types of auctions, their benefits and costs, how they operate, when to use them, and the potential for auction abuse and fraud.

11.3 Describe the major types of Internet portals and their business models.

NEW Video Cases

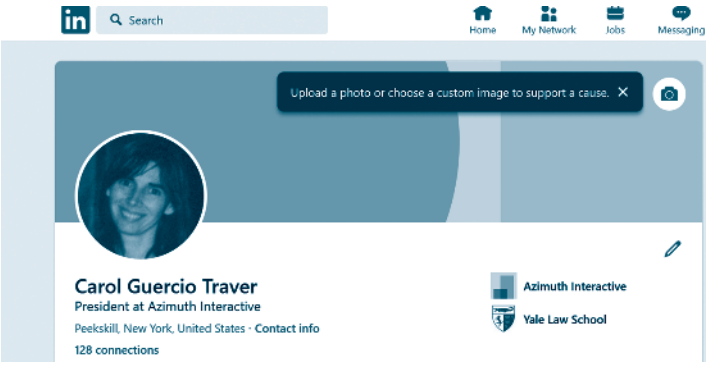
See **eText Chapter 11** to watch these videos and complete activities:

11.1 Nextdoor and Local Social Networks

11.2 Zigazoo: A Social Network for Kids

LinkedIn:

A Different Type of Social Network



Courtesy of Carol Traver

When social networks first appeared, it was widely believed the phenomenon would be limited to use by teenagers and young adults. Most of the technorati in Silicon Valley and Wall Street felt social networks were a blip on the horizon, and their full attention was occupied by search engines and online advertising. But when the population of social network participants pushed into the hundreds of millions, even those who were discounting the importance of social networks woke up to the fact that these huge audiences were not just a bunch of young people. Instead, a wide slice of society was participating.

Today, social networks have a position of outsized importance in everyday life. In addition to the hugely popular social networks aimed at the general population, there are a number that are aimed at more specific groups. Consider LinkedIn, the best-known and most popular business-oriented social network. LinkedIn is very different from Facebook, Instagram, Twitter, and TikTok in that, thus far, it has been able to escape much of the controversy that has surrounded those social networks through the years. For instance, LinkedIn has not been plagued with the same types of debates about misinformation and other types of harmful content as have its peers.

As of June 2022, LinkedIn has more than 830 million members in more than 200 countries worldwide and is available in 26 different languages. More than 58 million companies have a presence on the platform. In 2011, LinkedIn went public in what was, at the time, the biggest Internet IPO since Google, at a valuation of $8.9 billion. In 2016, Microsoft acquired LinkedIn for a whopping $26.2 billion. Although the price tag gave many analysts pause, the acquisition was a logical fit, giving Microsoft a long-desired social network presence as well as a tool to promote Microsoft software to professional audiences.

LinkedIn allows members to create a profile, including a photo, to summarize their professional accomplishments. Users can make direct connections with other people whom they know and trust in their professional community, and through them, extend the reach of their network to people to whom their connections are connected. LinkedIn also enables users to post commentary and thoughts on professional matters and be notified when people to whom they are connected do so. LinkedIn Groups allow users in the same industry or company to share content to a smaller, more specialized audience. There are

more than 2 million groups on LinkedIn, and more than half of LinkedIn's users belong to at least one group.

How members use LinkedIn depends somewhat on their position. Company executives, entrepreneurs, and business owners typically use it to promote their companies, while job seekers use LinkedIn to look for a new position (according to LinkedIn, 50 million people use LinkedIn to search for jobs each week, and 95 job applications are submitted every second of the day). Firms looking for new hires use LinkedIn as an important source of talent (according to LinkedIn, firms hire six people with whom they first made contact on LinkedIn every minute).

LinkedIn continues to introduce new features, including the ability to incorporate video in the form of video profiles; a podcast network; and a new events platform that will enable users to host interactive, virtual, live events. In 2021, LinkedIn launched a new Creator Mode feature for user profiles aimed at influencers, thought leaders, and public figures. Users are now able to just follow a creator profile, rather than needing to connect with the person.

How and why is LinkedIn a "different" type of social network? Perhaps the first difference is that because LinkedIn is aimed at a business audience, with most members joining to advance their job status or career, users are on their "best behavior." People are likely to self-censor to a much greater degree than on other social networks. In addition, LinkedIn has taken steps to help keep it a more civil, friendly, and productive place. For instance, on other social networks, there are few, if any, consequences for "bad behavior." Many social networks, such as Twitter and Facebook, allow users to post under pseudonyms. On LinkedIn, members must use their real identity. LinkedIn's share functionality, unlike Twitter's retweets, does not allow users to pass along other people's posts without accountability. Users can also block all political content from their feeds if they so wish. Another important factor is that LinkedIn's business model is aligned with its users' interests: Most of LinkedIn's revenue comes from premium products that users pay for. Because its users are its customers, LinkedIn needs to make sure that it serves their interests.

LinkedIn's practices have translated into its users having a high level of trust. For instance, in Insider Intelligence/eMarketer's annual 2021 Digital Trust Benchmark Report, LinkedIn was the most highly rated social network, ranking first in users' perceptions of security, legitimacy, community, and ad experience for the fifth year in a row. Users trust LinkedIn so much that their profiles typically include a plethora of personal information, such as full names, photos, biographical information, e-mail addresses, and more. In 2021, records of more than 700 million LinkedIn users were reportedly offered for sale on darknet sites, with the data apparently "scraped" by bots using a LinkedIn API. LinkedIn has filed lawsuits to block companies from scraping information from public member pages, but thus far courts have ruled that users who publicly post profile information do not have an expectation of privacy regarding that information. LinkedIn has vowed to pursue the case, asserting that it will continue to fight to protect its users' ability to control the information they make available on LinkedIn.

SOURCES: "About Us/Statistics," LinkedIn.com Press Center, accessed June 30, 2022; "Job's a Good'un: How LinkedIn Transformed Itself into a Gen Z-Friendly Social Media Contender," by James Ball, Theguardian.com, March 13, 2022; "LinkedIn Is Lauching Interactive, Clubhouse-style Audio Events This Month in Beta, A Video Version Will Come This Spring," by Ingrid Lunden, Techcrunch.com, January 6, 2022; "Why LinkedIn Is the One Good Social Network," by Alex Kantrowitz, Bigtechnology.substack.com, November 11, 2021; "Digital Trust Benchmark Report 2021," by Audrey Schomer and Debra Aho Williamson, Insider Intelligence/eMarketer, October 25, 2021; "The LinkedIn Data Breach That Wasn't," by David Braue, Ia.acs.org.au, July 7, 2021; "Why Microsoft Bought LinkedIn," by Christopher Mims, *Wall Street Journal*, June 14, 2016; "Microsoft to Acquire LinkedIn for $26.2 Billion, " by Jay Greene, *Wall Street Journal*, June 14, 2016.

In this chapter, we discuss social networks, auctions, and portals. What do social networks, auctions, and portals have in common? They are all based on feelings of shared interest and self-identification—in short, a sense of community. Social networks and online communities explicitly attract people with shared affinities, such as race, ethnicity, sex, gender, religion, and political views, or shared interests, such as hobbies, sports, and vacations. eBay started as a community of people interested in unwanted but functional items for which there was no ready commercial market. That community turned out to be huge—much larger than anyone expected. Portals also contain strong elements of community by providing access to community-fostering technologies such as e-mail, chat groups, bulletin boards, and discussion forums.

11.1 SOCIAL NETWORKS AND ONLINE COMMUNITIES

The Internet was designed originally as a communications medium to connect scientists in computer science departments around the continental United States. From the beginning, the Internet was intended, in part, as a community-building technology that would allow scientists to share data, knowledge, and opinions in a real-time online environment (see Chapter 3) (Hiltzik, 1999). The result of this early Internet was the first "virtual communities" (Rheingold, 1993). As the Internet grew in the late 1980s to include scientists from many disciplines and university campuses, thousands of virtual communities sprang up among small groups of scientists in very different disciplines that communicated regularly using Internet e-mail, listservs, and bulletin boards. The first articles and books on the new electronic communities began appearing in the mid- to late 1980s (Kiesler et al., 1984; Kiesler, 1986). One of the earliest online communities, The Well (originally Whole Earth 'Lectronic Link), was formed in San Francisco in 1985 by a small group of people who once shared an 1,800-acre commune in Tennessee. The Well continues to have thousands of members devoted to discussion, debate, advice, and help (Well.com, 2022; Hafner, 1997; Rheingold, 1998). With the development of the Web in the early 1990s, millions of people began obtaining Internet accounts and e-mail, and the community-building impact of the Internet strengthened. By the late 1990s, the commercial value of online communities was recognized as a potential new business model (Hagel and Armstrong, 1997).

The early online communities involved a relatively small number of web aficionados and users with intense interests in technology, politics, literature, and ideas. The technology was largely limited to posting text messages on bulletin boards sponsored by the community, and one-to-one or one-to-many e-mails. In addition to The Well, early networks included GeoCities, a website-hosting service based on neighborhoods. By 2002, however, the nature of online communities had begun to change. User-created websites called blogs became inexpensive and easy to set up without any technical expertise. Photo sites enabled convenient sharing of photos. Beginning in 2007, the growth of mobile devices like smartphones, tablet computers, digital cameras, and portable media devices enabled sharing of rich media such as photos, music, and videos. Suddenly there was a much wider audience for sharing interests and activities—and much more to share.

A new culture emerged as well. The broad democratization of the technology and its spread to the larger population meant that online social networks were no longer

limited to a small group but instead broadened to include a much wider set of people and tastes, especially pre-teens, teens, and college students, who were the fastest to adopt many of these new technologies. Entire families and friendship networks soon joined. The new social network culture is very personal and "me" centered, displaying photos and broadcasting personal activities, interests, hobbies, and relationships on social network profiles. Today's social networks are as much a sociological phenomenon as they are a technology phenomenon.

Currently, social network participation is one of the most common usages of the Internet, accounting for about 14.5% of total time spent with digital media (Insider Intelligence/eMarketer, 2022a). The growth in social network engagement since 2014 has been driven almost entirely by smartphone usage. About 74% of all Internet users and more than two-thirds of the total U.S. population—more than 220 million people—use social networks (Insider Intelligence/eMarketer, 2022b).

Worldwide, the social network phenomenon is even stronger, with more than 3.5 billion users worldwide (82% of all Internet users and 45% of the world's total population) (Insider Intelligence/eMarketer, 2022c). Social networks are a top online destination in every country. Asia-Pacific has the largest social network audience by far, followed by Latin America, but Latin America has the highest penetration of social network usage among Internet users. Although Facebook, which has 2.9 billion users worldwide as of March 2022, dominates the global social network marketspace, in some countries, localized social networks are significant, such as Taringa! in Argentina; KakaoStory and Naver Band in South Korea; social messaging app Line in Japan; WeChat, Douyin (a Chinese version of TikTok), and Sina Weibo (similar to Twitter) in China; Xing in Germany; and VK in Russia and parts of Central and Eastern Europe. There is an online social network for you to join almost anywhere you go.

WHAT IS AN ONLINE SOCIAL NETWORK?

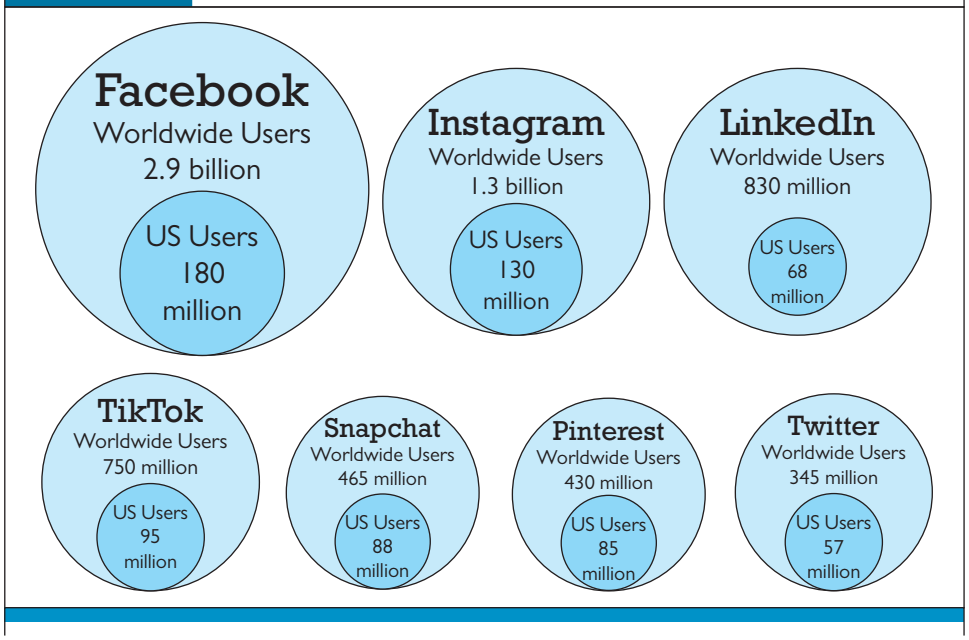
So, exactly how do we define an online social network, and how is it any different from, say, an offline social network? Sociologists, who frequently criticize modern society for having destroyed traditional communities, unfortunately have not given us very good definitions of social networks and community. One study examined 94 different sociological definitions of community and found four areas of agreement: **Social networks** involve (1) a group of people, (2) shared social interaction, (3) common ties among members, and (4) people who share an area for some period of time (Hillery, 1955). This will be our working definition of a social network. Social networks do not necessarily have shared goals, purposes, or intentions. Indeed, social networks can be places where people just "hang out," share space, and communicate.

social network involves a group of people, shared social interaction, common ties among members, and people who share an area for some period of time

It's a short step to defining an **online social network** as an online location where people who share common ties can interact with one another. This definition is very close to that of Howard Rheingold—one of The Well's early participants—who coined the term *virtual communities* as "cultural aggregations that emerge when enough people bump into each other often enough in cyberspace." It is a group of people who may or may not meet one another face to face, and who exchange words, photos, videos, and ideas through the mediation of an online social meeting space. The Internet removes the geographic and time limitations of offline social networks. To be in an online network, you don't need to meet face to face, in a common room, or at a common time.

online social network an online location where people who share common ties can interact with one another

FIGURE 11.1 TOP SOCIAL NETWORKS 2022



Facebook remains the dominant social network in terms of number of Internet users.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022e, 2021; Meta Platforms, Inc., 2022a; Pinterest, Inc., 2022; LinkedIn Corporation, 2022.

THE GROWTH OF SOCIAL NETWORKS AND ONLINE COMMUNITIES

Figure 11.1 shows the top social networks in the United States in terms of number of U.S. users. In 2022 around 180 million people in the United States (more than half of the population) uses Facebook at least once a month. The largest group of Facebook users are 25- to 34-year-olds (40 million), followed by 35- to 45-year-olds (34 million). Almost 44% of U.S. Facebook users (around 78 million) are older than 44. Adults over 65 constitute the fastest-growing group on Facebook (Insider Intelligence/eMarketer, 2022d). While Facebook is the most popular social network in terms of number of users, it has hit a plateau in the United States, and most of its growth is offshore. Even that growth has slowed, to around 2% a year.

While Facebook still tends to dominate the news, other social networks are growing much more quickly with respect to number of users. Instagram (owned by Facebook's parent company, Meta) has the second-highest number of U.S. users. Instagram focuses on video and photo sharing and has about 130 million users in the United States and more than 1.3 billion worldwide.

TikTok, the third-most-popular social network in the United States, is one of the fastest growing. TikTok, launched in 2017, is a short-form video sharing app owned by Chinese company Bytedance. It has almost 95 million U.S. users and more than 750 million worldwide. Many TikTok videos feature music, with users lip-syncing, singing, and dancing; others focus on comedy and creativity. Users can "remix" posts from other users and put their own spin on them using the app's array of editing tools, filters, and other effects. Algorithms analyze the viewing habits of each user and provide

content that is customized based on their activity. TikTok skews much younger than other social networks and is the most popular network in the United States among children, teens, and young adults. Almost 45% of its U.S. users are under the age of 25. TikTok's rapid ascent is due in part to its contrast to other social networks. For example, Instagram has a polished feel, while TikTok is viewed as more spontaneous and fun to use. See the opening case in Chapters 1 and 7 for more information about TikTok.

Snapchat, launched in 2009, lets users send photos and videos to friends that self-extinguish in 10 seconds. Snapchat Stories have a longer lifespan: 24 hours. Snapchat has about 88 million users in the United States and about 465 million worldwide. Like TikTok, Snapchat is more popular with teens and young adults than Facebook is.

Pinterest is a visually oriented social network that allows users to curate their tastes and preferences, expressed in visual arts. One way to think of Pinterest is as a visual blog. Users post images to an online "pinboard." The images can come from any source. Users can also "re-pin" images they see on Pinterest. Pinterest has about 85 million users in the United States and more than 430 million monthly active users worldwide.

Although Twitter has fewer users than the other major social networks, it attracts significant public attention because of the role that it plays in public life. Twitter is a social network originally based on sharing "tweets," text messages that could not be any longer than 140 characters. Today, that limit has been expanded to 280 characters, as well as videos and photos. Twitter has about 57 million U.S. users and around 345 million worldwide. See the Chapter 2 case study for more information about Twitter.

There are also a number of other social networks that add to the social network mix and enlarge the total social network audience. **Table 11.1** describes some other popular social networks.

Contributing to the continued growth and commercial success of networks is the rapid adoption and intense use of mobile devices. About 95% of Facebook's U.S. users access Facebook from a mobile device at least some of the time, and more than

TABLE 11.1 OTHER SOCIAL NETWORKS

SOCIAL NETWORK	DESCRIPTION
Be Real	Social app that prompts all users to simultaneously take both an unfiltered "selfie" as well as a photo of whatever is in front of them once per day at a random time within 2 minutes of being notified; 10 million active users as of August 2022.
MeWe	Facebook-like social network that includes private and public groups, newsfeeds, chat features, and more, without ads. Does not track users or sell data.
Nextdoor	Social network focused specifically on neighbors and surrounding community.
Meetup	Helps groups of people with shared interests plan events and meet offline.
Vero	Social network aimed at sharing recommendations and photos with friends.
Mastodon	Open-source alternative to Twitter.
Clubhouse	Audio-based social network that allows members to participate in conversations with other members.

two-thirds are mobile-only users. In 2022, Facebook's flagship Facebook app is the second-most-popular smartphone app (behind YouTube) among U.S. smartphone users in terms of both number of users and reach (Comscore, Inc., 2022a). Some social networks, such as Instagram and Snapchat, are almost entirely mobile.

A number of social networks focus primarily on messaging. WhatsApp, launched in 2009 and acquired by Facebook/Meta in 2014, is a messaging service that lets users send text, photos, and videos to their friends' cellphones using the Internet and without having to pay telecommunications companies for cellphone SMS messaging services. In 2022, Meta announced plans for additional social network features for WhatsApp, including Communities, a collection of group chats linking people who share a common interest. As with Facebook Groups, a WhatsApp community will have a community administrator. WhatsApp has more than 2 billion users worldwide (Brown, 2022). Discord is a voice and chat platform that originally focused on video games, but that has become more of a full-fledged social network, with more than 150 million users and 19 million active communities worldwide.

The number of unique visitors is just one way to measure the influence of a site or app. Time is another important metric. The more time people spend on a site or app, called engagement, the more time there is to display ads and generate revenue. **Table 11.2** illustrates the different levels of engagement with the top social networks, based on time spent per month. Over the last few years, Facebook has been dethroned as the social network leader in terms of time spent, and now ranks third behind the leaders, TikTok and Twitter.

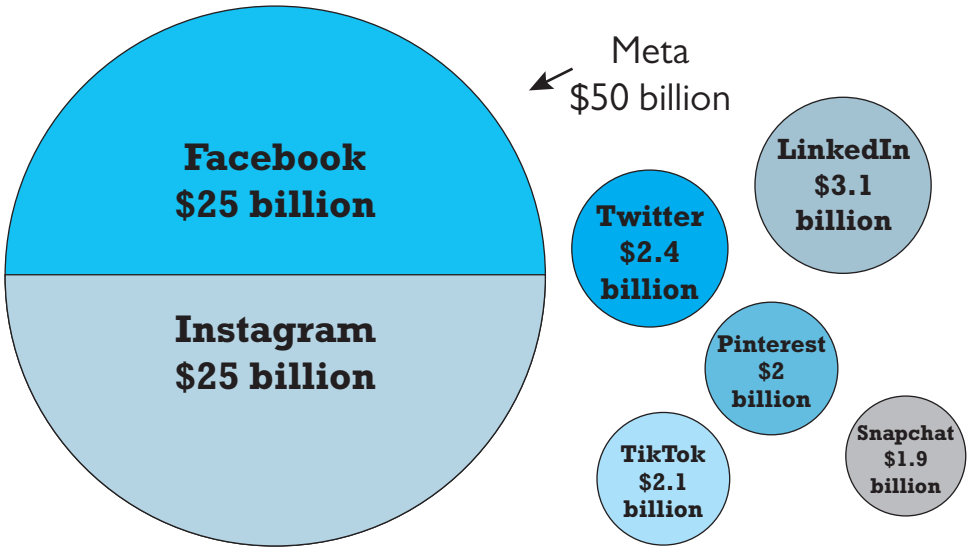
The amount of revenue generated is the ultimate metric for measuring a company's business potential. Spending on social network advertising in the United States in 2022 is expected to generate only about 30% of total digital ad spending (about $75 billion) (Insider Intelligence/eMarketer, 2022k). A part of the problem is that users typically do not go to social networks to seek ads for relevant products, nor pay much attention to the ads that are presented there (see Chapters 6 and 7). In addition, the small screen of the smartphone, the dominant social network platform, is not ideal for display advertising. That said, social network advertising and the social e-commerce that social network advertising facilitates are becoming increasingly important.

TABLE 11.2 TIME SPENT ON TOP SOCIAL NETWORKS, 2022

SOCIAL NETWORK	HOURS/MONTH
TikTok	19
Twitter	17.5
Facebook	15.5
Snapchat	15
Instagram	14.5
Pinterest	7

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022f, 2022g, 2022h, 2022i, 2022j; Broadband Search, 2022; authors' estimates.

FIGURE 11.2 U.S. AD SPENDING ON TOP SOCIAL NETWORKS, 2021



SOURCE: Based on data from Insider Intelligence/eMarketer, 2022l.

TURNING SOCIAL NETWORKS INTO BUSINESSES

Early social networks relied on subscriptions, but today, most social networks rely on advertising. One important exception is LinkedIn, which offers basic free memberships for individuals but charges for premium services. **Figure 11.2** shows the comparative amount of ad spending on various social networks. Meta, with more than $50 billion in ad revenue (including ad revenue from both Facebook and Instagram), towers over the other social networks in ad spending. View the Figure 11.2 video in the eText for an animated and more detailed discussion of this figure.

The rapid adoption of mobile devices initially posed a challenge to social networks like Facebook. However, Facebook quickly developed its own mobile app, and purchased others such as Instagram, and within the space of a few years was able to capture about 50% of the mobile display ad market. Out of the top 10 apps, three are owned by Meta: the main Facebook app (2nd), Facebook Messenger (7th), and Instagram (10th) (Comscore, Inc., 2022a). In 2022, about 97% of Meta's U.S. revenue (including both Facebook's and Instagram's revenue) is expected to come from mobile advertising (Insider Intelligence/eMarketer, 2022m).

Social networks have had an important impact on how businesses operate, communicate, and serve their customers. A recent survey of Fortune 500 firms found that these firms are increasing their use of social media. Almost all Fortune 500 firms (98%) use LinkedIn, 91% use Twitter, 89% use Facebook, and 63% use Instagram (Marketing Charts, 2021; Unboxsocial.com, 2019). The most visible business firm use of social networks is as a marketing and branding tool. A less visible marketing use of social networks is as a powerful listening tool that has strengthened the role of customers and customer feedback systems inside a business.

Social networks are where corporate brands and reputations are formed, and firms today take very seriously the topic of "online reputation," as evidenced by social network posts, commentary, chat sessions, and likes. In this sense, social networks become an extension of corporate customer relationship management systems and extend existing market research programs. Beyond branding, social networks are being used as advertising platforms to contact targeted audiences. Yet the business use of social networks does not always go well. The *Insight on Society* case, *Businesses Beware: The Dark Side of Social Networks*, discusses some of the risks associated with businesses' use of social networks.

TYPES OF SOCIAL NETWORKS AND THEIR BUSINESS MODELS

There are many types and many ways of classifying social networks and online communities. While the most popular general social networks have adopted an advertising model, other kinds of networks have different revenue sources. Social networks have different types of sponsors and different kinds of members. For instance, some are created by firms such as IBM for the exclusive use of their sales force or other employees (intra-firm communities or B2E [business-to-employee] communities); others are built for suppliers and resellers (inter-organizational or B2B communities); and others are built by dedicated individuals for other, similar persons with shared interests (P2P [people-to-people] communities). In this chapter, we will discuss B2C communities for the most part, although we also briefly discuss P2P communities of practice.

Table 11.3 describes in greater detail the five generic types of social networks and online communities: general, practice, interest, affinity, and sponsored. Each type of community can have a commercial intent or commercial consequence. We use this schema to explore the business models of commercial communities.

TABLE 11.3 TYPES OF SOCIAL NETWORKS AND ONLINE COMMUNITIES

TYPE OF SOCIAL NETWORK/ COMMUNITY	DESCRIPTION
General	Online social gathering place to meet and socialize with friends and share content, schedules, and interests. Examples: Facebook, Instagram, TikTok, Pinterest, and Twitter.
Practice	Social network of professionals, practitioners and creators. Examples: Just Plain Folks (musicians' community), Doximity (physicians and health care professionals).
Interest	Community built around a common interest, such as games, sports, music, stock markets, politics, health, finance, foreign affairs, or lifestyle. Examples: Debate Politics (political discussion group) and College Confidential (college admissions).
Affinity	Community of members who self-identify with a demographic, racial, or ethnic category. Examples: Peanut, a social network for women; Built by Girls, a community for next-generation female and non-binary leaders, and BlackPlanet, a Black community and social network.
Sponsored	Network created by commercial, government, and nonprofit organizations for a variety of purposes. Examples: Nike, IBM, Cisco, and political candidates.

INSIGHT ON SOCIETY

BUSINESSES BEWARE: THE DARK SIDE OF SOCIAL NETWORKS

Almost all major companies use social networks to market to and connect with customers. Although it can be a productive method of connecting and engaging with customers, if businesses are not careful, it is easy for this form of marketing to go very wrong. For instance, Draper James, actress Reese Witherspoon's fashion label, announced on its Instagram page that it was offering teachers a free dress in recognition of their hard work. The offer required an application, had a deadline, noted that winners would be notified, and included the caveat that it was valid only while supplies lasted. Although an altruistic effort, the offer backfired. More than 1 million teachers applied, but Draper James had only 250 dresses to give away. Although the company tried to clarify as soon as it realized the problem, the damage had been done, especially since applicants had been asked to submit their work e-mail addresses, which were soon flooded with Draper James promotional e-mails. Many applicants took to social media to slam the brand. In another example, Burger King's "women belong in the kitchen" tweet on International Women's Day sparked outrage even though the intent of the tweet was to promote the launch of an initiative to help increase the number of female chefs in restaurants. Burger King first attempted to explain its intent and later apologized. In another example, ESPN's "SportsCenter" Twitter account posted a photo referencing a 13-year-old character from the HBO series *Euphoria* who was depicted in the series as living a life replete with drugs and violence, with the caption: "Name an athlete as fearless as this guy." The tweet was soon removed, with ESPN stating that it was not in alignment with its brand values. In January 2022, a Pabst Blue Ribbon employee posted a vulgar tweet using the brand's official Twitter account. Although quickly deleted, other brands, such as Slim Jim and the delivery app Waitr, made for an even more embarrassing situation by commenting on the tweet.

Businesses that have a presence on social networks must also be careful about content on the platform that appears adjacent to the brand's content or advertisements. Disturbing or divisive content, even when totally unrelated to the brand, can negatively impact the brand's reputation. This issue, known as brand safety, has become a major focus of both brands and social networks. The use of influencer marketing on social networks adds another layer of complication for businesses. Although influencers can be an effective way for companies to reach target audiences, to do so, companies must often give the influencer a great deal of freedom in deciding how to promote a brand. This creates a number of potential risks. For instance, the influencer may promote the product in a misleading or harmful way, or the influencer may post unrelated content that people may find offensive or inappropriate. It is also possible that the influencer may post conflicting content, such as for a competing brand. Companies must make sure that they adopt appropriate safeguards to protect their brands from these kinds of mistakes.

Customer service is another area where using social networks to connect with customers

can lead to unforeseen complications. The quality of customer service on social networks can have a significant impact on brand perception. Small or isolated customer service issues can easily turn into a PR disaster, with the risk that other customers and influencers will pile on, creating a viral effect. For instance, British Airways was criticized for its customer service on Twitter, as the company frequently asked customers seeking help with flights to post confidential personal information as part of public conversations on the Twitter platform. Ironically, the company's customer service agents often stated that the information was necessary to comply with Europe's General Data Protection Regulation (GDPR), which is intended to safeguard user information—the exact opposite of what was happening in British Airways' customer service interactions with users.

Another major issue for businesses with a presence on social networks is responding to negative reviews or commentary posted by customers. Businesses that ignore negative reviews are doing their brands a major disservice. Although deleting negative reviews and commentary may be tempting, businesses should be aware that the Federal Trade Commission recently fined fast-fashion retailer Fashion Nova $4.2 million to settle allegations that it blocked negative reviews from appearing on its website. However, this does not mean that businesses are prevented from removing abusive commentary that contains slurs or other offensive content. Best practices for handling negative reviews and commentary include having social listening or feedback tools that allow a company to track negative comments, responding quickly in a non-defensive manner, apologizing when necessary, and knowing when to move the engagement with the customer to a private channel such as a direct message.

Businesses must be careful with personal information about their employees gleaned from social networks. As of the end of 2021, more than half of U.S. states have laws that prevent employers from asking employees or potential employees for access to user names or passwords to personal social network accounts. Additionally, 15 states plus the District of Columbia have enacted laws that forbid educational institutions from doing so for their prospective students, and one state, Wisconsin, also prohibits landlords from doing so with respect to prospective tenants. However, all employees and prospective employees should be aware that this does not prevent companies from viewing their public social network profiles.

Carefully crafted policies can help companies to avoid the dark side of social networks. Businesses must also develop policies regarding employee use of the company's social network presence and teach employees which infractions can be grounds for disciplinary action. Marketing departments should also be educated on best practices so that they avoid social network marketing pitfalls. Social media is an exciting tool, but one that requires safeguards.

SOURCES: "Social Media as a Service Differentiator: How to Win," by Avinash Chandra et al., Mckinsey.com, April 27, 2022; "ESPN Deletes Cringey 'SportsCenter' Tweet with 'Euphoria' Meme," by Ryan Glasspiegel, Nypost.com, February 28, 2022: "TikTok Launches New Brand Safety Center to Provide a Central Hub for Its Various Resources," by Andrew Hutchinson, Socialmediatoday.com, February 15, 2022; "FTC Gives Retailers a $4 Million Reason Not to Delete Negative Reviews," by Zak Stambor, Insider Intelligence/eMarketer, January 28, 2022; "Pabst Blue Ribbon Apologizes for Crude, Controversial Twitter Post," by Michael Bartiromo, Wgntv.com, January 4, 2022; "State Social Media Privacy Laws," Ncsl.org, November 18. 2021; "Burger King Was Recently Blasted for a Tone-Deaf Marketing Tweet. Here are 5 Other Big Brands Whose Campaigns Caused a Stir," by Zahra Tayeb, Businessinsider.com, March 25, 2021; "How to Respond to Negative Social Media Reviews," by Rebecca Kowalewicz, Forbes.com, March 10, 2021; "Reese Witherspoon's Fashion Line Offered Free Dresses to Teachers. They Didn't Mean Every Teacher," by Vanessa Friedman, *New York Times*, April 15, 2020; "British Airways Shows Everyone How Not to GDPR," by Natasha Lomas, Techcrunch.com, July 19, 2018.

general communities
offer members opportunities to interact with a general audience organized into general topics

practice networks
offer members focused discussion groups, help, information, and knowledge relating to an area of shared practice

interest-based social networks
offer members focused discussion groups based on a shared interest in some specific topic

affinity communities
offer members focused discussions and interaction with other people who share the same affinity

sponsored communities
online communities created for the purpose of pursuing organizational (and often commercial) goals

algorithms
sets of step-by-step instructions, similar to a recipe, for producing a desired output from required inputs

computer algorithms
computer programs that carry out step-by-step instructions to produce desired outputs

General communities offer members opportunities to interact with a general audience organized into general topics. Within the topics, members can find hundreds of specific discussion groups attended by thousands of like-minded members who share an interest in that topic. The purpose of the general community is to attract enough members to populate a wide range of topics and discussion groups. The business model of general communities is typically advertising supported by selling ad space on pages and videos.

Practice networks offer members focused discussion groups, help, information, and knowledge relating to an area of shared practice. For instance, Linux.org is a nonprofit community for the open-source movement, a worldwide global effort involving thousands of programmers who develop computer code for the Linux operating system and share the results freely with all. Other online communities involve artists, educators, art dealers, photographers, and nurses. Practice networks can be either profit-based or nonprofit, and typically support themselves by advertising or user donations.

Interest-based social networks offer members focused discussion groups based on a shared interest in some specific subject, such as business careers, boats, horses, health, skiing, and thousands of other topics. Because the audience for interest communities is necessarily much smaller and more targeted, these communities have usually relied on advertising and tenancy/sponsorship deals. Social networks such as College Confidential (college admissions), Ravelry (knitting and crocheting), Sailing Anarchy (sailing), and Chronicle Forums (horse enthusiasts) all are examples of social networks that attract people who share a common pursuit. Forums such as LinkedIn can be considered interest-based social networks as well.

Affinity communities offer members focused discussions and interaction with other people who share the same affinity. "Affinity" refers to self- and group identification. For instance, people can self-identify themselves on the basis of race, religion, ethnicity, gender, sexual orientation, political beliefs, geographical location, and hundreds of other categories. These social networks are supported by advertising along with revenues from sales of products.

Sponsored communities are online communities created by government, nonprofit, or for-profit organizations for the purpose of pursuing organizational goals. These goals can be diverse, from increasing the information available to citizens (for instance, Westchestergov.com, the website for Westchester County [New York] government); to an online auction such as eBay; to Tide.com, which focuses on uses of Tide detergent and is sponsored by its manufacturer (Procter & Gamble). Cisco, IBM, HP, and hundreds of other companies have developed their internal corporate social networks as a way of sharing knowledge.

SOCIAL NETWORK TECHNOLOGIES AND FEATURES

Algorithms are one of the most important technologies used by social networks. **Algorithms** are sets of step-by-step instructions, similar to a recipe, for producing a desired output from required inputs. **Computer algorithms** are computer programs that carry out step-by-step instructions to produce desired outputs (Cormen et al., 2009). Algorithms are an ancient concept but are fundamental to how computers

are used today to do everything from calculating paychecks, the amount you owe when purchasing online, selecting movies on Netflix that you are likely to watch, or recommending products you may be interested in based on your prior purchases. How, for instance, does Facebook decide which of your posts to post on your friends' Feeds?

The problem that Facebook and other social networks need to solve is how to select content for display on users' pages that they will find interesting, and likely click on. Also, Facebook needs to prevent information that is irrelevant from appearing on user pages. **Figure 11.3** illustrates the generic algorithm that Facebook uses to produce what it calls relationship-based content personalized for members of a social network based on a patent it filed in 2010. It shows the eight generic steps in the algorithm (left column), and a translation of each step (right column). Facebook users organize themselves into affinity groups by selecting and accepting one another as friends. **Affinity groups** are a key concept here and in all social networks: They are generally composed of like-minded people who share views, attitudes, purchase patterns, and tastes in such things as music and videos. Facebook attempts to discover exactly what those views, attitudes, purchase patterns, and tastes are, as well as demographic and other personal information. Once these are identified, Facebook attempts to find out what content is being consumed by each affinity group and matches the content to each group (relation-base content). Facebook creates a database of this relationship-based content, and serves it to other members of the group, as well as to other affinity groups that share similar features.

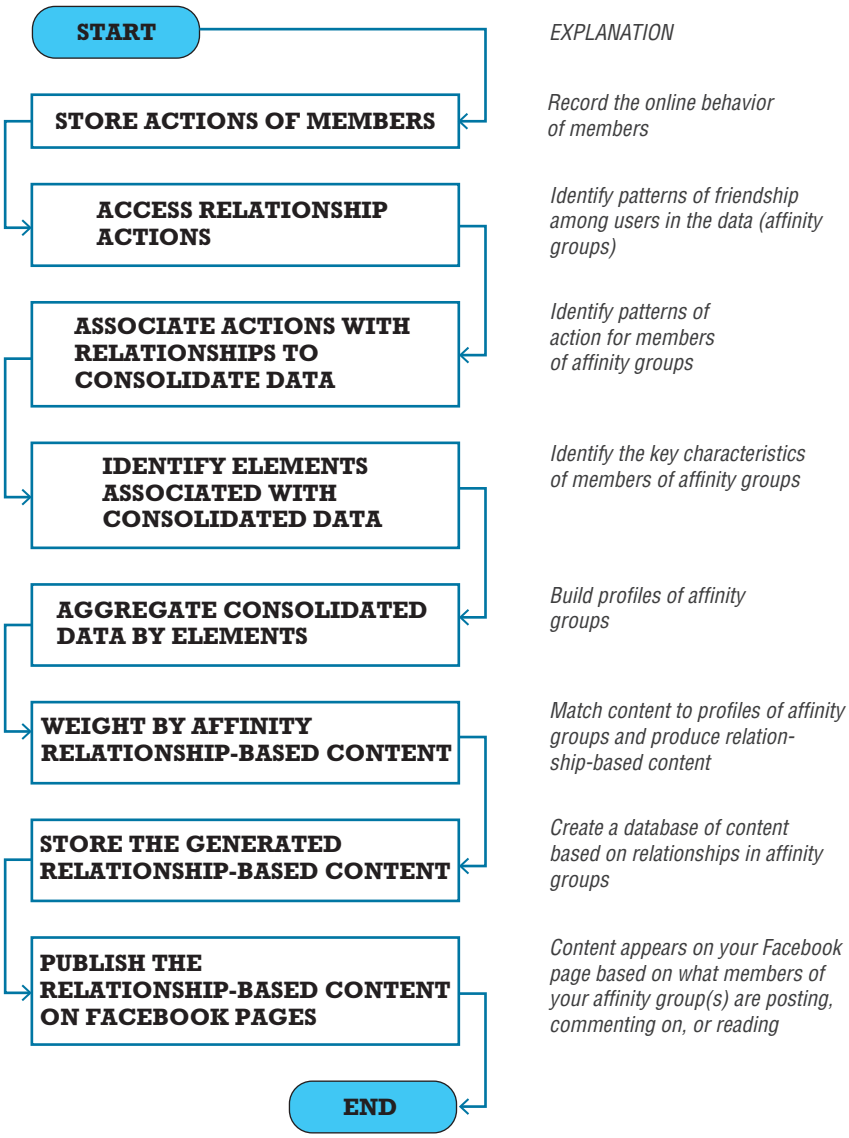
affinity groups
generally composed of like-minded people who share views, attitudes, purchase patterns, and tastes in such things as music and videos

In the end, you will be informed of what your friends are doing, liking, viewing, and listening to. You presumably will find this interesting and engaging. You will be spared hearing about other affinity groups who are very dissimilar to your affinity groups. New content (news, music, videos) that is similar to what your affinity group has liked in the past will also be presented to you. For instance, if you are a staunch conservative or liberal, and you choose to click on articles that confirm your views, other members of your affinity group who share your views will have the content and your behavior displayed on their pages. They in turn may share this content with other Facebook friends and other affinity groups of which they are a part.

While the generic algorithm appears simple, each step in the algorithm is implemented by computer programs involving tens of thousands of lines of computer code and thousands of hours of software engineering and system development. According to Facebook, loading a user's home page, which includes the user's Feed, involves hundreds of servers processing tens of thousands of individual pieces of data and delivering the information selected in less than one second. Facebook currently has 21 data centers worldwide containing tens of thousands of servers, all connected by fiber optic networks, to process the data generated by more than 2.9 billion users worldwide (Facebook, Inc., 2022b). The *Insight on Technology* case, *Are Facebook's Algorithms Dangerous?* examines Facebook's use of algorithms in further depth.

Social networks also have developed a number of other software applications that allow users to engage in a number of activities. **Table 11.4** on page 681 describes several additional social network features and functionalities.

FIGURE 11.3 FACEBOOK'S ALGORITHM FOR GENERATING PERSONALIZED STORIES



Facebook uses a very complex algorithm to identify content that users are likely to click on. Each step in the algorithm is implemented by computer programs involving tens of thousands of lines of computer code and thousands of hours of software engineering and system development.

SOURCE: Based on data from United States Patent and Trademark Office, 2010.

INSIGHT ON TECHNOLOGY

ARE FACEBOOK'S ALGORITHMS DANGEROUS?

Computer algorithms are not normally the topic of headline news. But it's a different story when the algorithms in question involve Facebook, the world's most "popular" social network (based on the number of users) but also one of the most reviled. From just about its earliest days, Facebook has been hounded by controversy. Initially, the focus was primarily on how its practices impacted user privacy. However, over the last several years, there has been an increasing focus on Facebook's role in providing a platform for misinformation and other harmful content and, specifically, the role that Facebook's algorithms play in that process.

Although Facebook has a number of different algorithms, when people talk about the Facebook algorithm, they are generally referring to Facebook's News Feed algorithm, which Facebook renamed just the "Feed" in 2022. The Feed contains a constantly updating list of posts from people, groups, and pages that the user follows or otherwise interacts with on Facebook. The Feed also contains sponsored posts (advertisements) and suggestions from Facebook as to other pages the user might be interested in.

Many people do not realize that what appears in their Feed is curated by Facebook's algorithm. Facebook introduced its first News Feed algorithm in 2009 (one that simply placed posts with the most Likes at the top of the Feed) and since then, has continually adjusted it to prioritize different factors to suit its business needs. For instance, companies and individuals posting on Facebook learned how to create headlines and posts designed to induce views and likes, giving rise to what came to be known as "clickbait." Facebook recalibrated the algorithm in 2014 and 2015 to downgrade clickbait and focus on new metrics, such as the amount of time a user spent with a post or watching a video. Around that time, Facebook identified video as a business priority and used the algorithm to boost posts with video. Shortly thereafter, it further adjusted the algorithm to give more weight to reactions symbolizing love and anger rather than a simple Like.

From Facebook's point of view, its algorithms solve an important problem for today's users of social networks: There is so much information online that users may become inundated with information that does not interest them. This also makes it difficult for users to find information that does interest them. The resulting frustration could turn users away from social networks that increasingly are their main source of news and opinion. Therefore, there was a need for what Facebook refers to, in its patent applications for both algorithms, as "a system to generate dynamic, relationship-based content personalized for members of a Social Network." Translated, this means the algorithms are set up to engage you and keep you on Facebook, exposing you to more ads.

The existence of the algorithm, and changes to it, initially did not attract much attention. However, that is no longer the case. Over the past several years, Facebook has come under intense scrutiny in connection with the spread of false news stories (fake news), misinformation, and harmful content on its platform beginning most notoriously in the period preceding the 2016 presidential election. During that time, Facebook's advertising system enabled manipulators who had created hundreds of thousands of fake accounts to target people they believed would be receptive to their message and likely to Like it, post it, and forward it to their network

(continued)

(continued)

of friends. If 1,000 people respond to a post and each of those people has 10 friends, then the message could potentially make its way to 1 million people or more in a matter of hours, influencing what Facebook's algorithms notice, which will result in even more people getting the message. One result of this process is the creation of a "bubble world" where messages rocket through the network in hours. Researchers have found that fake news and misinformation travel faster and further than news from reputable sources because the former are typically more alarming, emotional, and unusual.

In 2018, Facebook revamped the News Feed algorithm yet again to prioritize content shared by friends and family over posts from publisher pages. In particular, the algorithm began to give greater weight to posts that sparked lots of comments and replies. Although Facebook CEO Mark Zuckerberg claimed the intent was to promote user well-being, others believed the underlying reason was to encourage users to interact with one another more often, which Facebook believed was critical to remaining relevant as younger users gravitated to rivals such as Snapchat. But studies showed that the change exacerbated the Facebook echo chamber rather than ameliorated it, emphasizing articles and posts on divisive topics and engendering shared angry reactions. Rather than increasing user engagement, the algorithm rewarded posts oriented toward outrage and sensationalism, making the Facebook environment more and more toxic.

Critics charge that Facebook has helped to create a highly polarized society: Users see only the social and political views of their friends on controversial topics, creating a self-reinforcing, bubble world. Sometimes referred to as the Facebook echo chamber or bubble, critics believe this results in groups who rarely share news or interact with people who have differing views and who therefore cannot find a middle ground to share.

In October 2021, the *Wall Street Journal* began publishing a trove of internal Facebook documents provided by a former employee, Frances Haugen. The files provided an unprecedented view into Facebook's inner deliberations and validated many of its critics' charges, including the extent to which Facebook's own studies revealed the harmful impact its algorithms were having on social well-being. Testifying before the U.S. Senate, Haugen painted a picture of a company unable to control the "monster" it had created. The revelations have focused lawmakers' attention on the Facebook algorithm and on whether such algorithms should be subject to federal regulation. Currently, the algorithm takes into account more than 10,000 different signals to make predictions about a user's likelihood of engaging with a post, according to Facebook. How such a complex system can be "fixed" is unclear, as is whether that could be accomplished without ruining what people still like about social networks or running afoul of the First Amendment.

SOURCES: "We're Publishing the Facebook Papers. Here's What They Say about the Ranking Algorithm That Controls Your News Feed," by Dell Cameron et al., Gizmodo.com, May 2, 2022; "How the Facebook Algorithm Works in 2022 and How to Make It Work for You," by Christina Newberry, Blog.hootsuite.com, February 28, 2022; "Facebook Renames Its News Feed to Just 'Feed,'" by K. Bell, Engadget.com, February 15, 2022; "How Facebook Shapes Your Feed," by Will Oremus et al., *Washington Post*, October 26, 2021; "Lawmakers' Latest Idea to Fix Facebook: Regulate the Algorithm," by Will Oremus, *Washington Post*, October 12, 2021; "Facebook Whistleblower Frances Haugen Testified that the Company's Algorithms Are Dangerous—Here's How They Manipulate You," by Fillippo Menczer, Theconversation.com, October 7, 2021; "The Spread of True and False News Online," by Soroush Vosoughi, Deb Roy, and Sinan Aral, *Science*, March 9, 2018; "The Reason Your Feed Became an Echo Chamber—And What to Do About It," NPR.com, July 24, 2016; "Your Facebook Echo Chamber Just Got a Whole Lot Louder," by Brian Barrett, Wired.com, June 29, 2016; "How Facebook Warps Our Worlds," by Frank Bruni, *New York Times*, May 21, 2016; *The Filter Bubble*, by Eli Pariser. Penguin Books; Reprint edition (April 24, 2012); Facebook, "Generating a Feed of Stories Personalized for Members of a Social Network," US Patent 7827208 B2, United States Patent and Trademark Office, November 2, 2010.

TABLE 11.4 SOCIAL NETWORK FEATURES

FEATURE	DESCRIPTION
Profiles	User-created pages that describe the owner on a variety of dimensions
Feed	Updates from friends, advertisements, and notifications
Timeline	A history of updates, posts from friends, photos, and other objects in chronological order
Stories	Collection of photos and videos that capture a user's experience
Friends	Ability to create a linked group of friends, a social community
Network discovery	Ability to find new groups and friends and to discover friends of friends
Favorites (Like)	Ability to communicate favorite content, sites, bookmarks, and destinations
Games and apps	Games developed for the social network and apps that extend the network's functionality
Instant messaging	Instant messaging, chat
Storage	Storage for photos, videos, text
Message boards	Ability to post updates to friends (e.g., Wall)
Groups	Discussion groups, forums, and consumer groups organized by interest (e.g., For Sale Groups)

11.2 ONLINE AUCTIONS

In the early days of e-commerce, online auctions were a popular method for the purchase and sale of goods. The most widely known auctions were, and continue to be, **consumer-to-consumer (C2C) auctions**, in which the auction company is simply an intermediary market maker, providing a forum where consumers—buyers and sellers—can discover prices and trade. The market leader in C2C auctions is eBay, which, as of the end of March 2022, had around 142 million global active buyers, 17 million sellers, and around 1.6 billion items listed on any given day within thousands of different categories. (eBay, Inc., 2022a, 2022b). While eBay started as an auction site for mostly used goods, today, almost 90% of eBay's listings are for products sold with either fixed or best-offer pricing. eBay is further discussed in the case study at the end of this chapter. Despite the decline in online auctions as a popular method for sale, numerous online auctions remain, many specializing in unique collectible products such as stamps and coins. Auctions also constitute a significant part of B2B e-commerce.

consumer-to-consumer (C2C) auctions
auction house acts as an intermediary market maker, providing a forum where consumers can discover prices and trade

Some leading online auctions are listed in **Table 11.5**. Auctions are not limited to goods and services. They can also be used to allocate resources, and bundles of resources, among any group of bidders.

TABLE 11.5 LEADING ONLINE AUCTIONS

GENERAL	
eBay	The world market leader in auctions: around 100 million visitors a month and around 1.6 billion listings on an average day.
eBid	In business since 1999. Operates in 23 countries, including the United States. Currently, one of the top competitors to eBay. Offers much lower fees.
SPECIALIZED	
Auction.com	Bank-owned and foreclosed real estate
Copart	Used, wholesale, and repairable cars
Bidspotter	Industrial equipment
Stacks Bowers	Certified coins including ancient gold, silver, and copper coins. Also offers sports cards.
Bid4Assets	Liquidation of distressed real estate assets from government and the public sector, corporations, restructurings, and bankruptcies.
Old and Sold Antiques Auction	Specializes in quality antiques. Dealers pay a 3% commission on merchandise sold.

BENEFITS AND COSTS OF AUCTIONS

The Internet is primarily responsible for the resurgence in auctions. The Internet provides a global environment and very low fixed and operational costs for the aggregation of huge buyer audiences, composed of millions of consumers worldwide, who can use a universally available technology (Internet browsers) to shop for goods.

Benefits of Auctions

Aside from the sheer game-like fun of participating in auctions, consumers and merchants derive a number of economic benefits from participating in Internet auctions. These benefits include:

- **Liquidity:** Sellers can find willing buyers, and buyers can find willing sellers. Sellers and buyers can be located anywhere around the globe. Just as important, buyers and sellers can find a global market for rare items that would not have existed before the Internet.
- **Price discovery:** Buyers and sellers can quickly and efficiently develop prices for items that are difficult to assess, when the price depends on demand and supply, and when the product is rare.
- **Price transparency:** Public online auctions allow everyone to see the asking and bidding prices for items.
- **Market efficiency:** Auctions can, and often do, lead to reduced prices, and hence reduced profits for merchants, leading to an increase in consumer welfare—one measure of market efficiency.

- **Lower transaction costs:** Online auctions can lower the cost of selling and purchasing products, benefiting both merchants and consumers. Like other Internet markets, such as retail markets, online auctions have very low (but not zero) transaction costs.
- **Consumer aggregation:** Sellers benefit from large online auctions' ability to aggregate a large number of consumers who are motivated to purchase something in one marketspace.
- **Network effects:** The larger an online auction becomes in terms of visitors and products for sale, the more valuable it becomes as a marketplace for everyone by providing liquidity and several other benefits listed previously, such as lower transaction costs, higher efficiency, and better price transparency.

Risks and Costs of Auctions

There are a number of risks and costs involved in participating in auctions. In some cases, auction markets can fail—like all markets at times. (We describe auction market failure in more detail later.) Some of the more important risks and costs to keep in mind are:

- **Delayed consumption costs:** Online auctions can go on for days, and shipping will take additional time.
- **Monitoring costs:** Participation in auctions requires your time to monitor bidding.
- **Equipment costs:** Online auctions require you to purchase a computer system and pay for Internet access.
- **Trust risks:** Using auctions increases the risk of experiencing a loss due to fraud on the part of either the seller or the buyer.
- **Fulfillment costs:** Typically, the buyer pays the fulfillment costs of packing, shipping, and insurance, whereas at a physical store these costs are included in the retail price.

Online auctions such as eBay have taken steps to reduce consumer participation costs and trust risk. For instance, online auctions attempt to solve the trust problem by providing a rating system in which previous customers rate sellers based on their overall experience with the merchant. Although helpful, this solution does not always work. Another partial solution to high monitoring costs is, ironically, fixed pricing. At eBay, consumers can reduce the cost of monitoring and waiting for auctions to end by simply clicking on the Buy It Now button and paying a premium price. The difference between the Buy It Now price and the auction price is the cost of monitoring.

Nevertheless, given the costs of participating in online auctions, the generally lower cost of goods on online auctions is in part a compensation for the other, additional costs consumers experience. On the other hand, consumers experience lower search costs and transaction costs because there usually are no intermediaries (unless, of course, the seller is an online business, in which case there is a middleman cost), and often there are no local or state taxes.

Merchants face considerable risks and costs as well: At auctions, merchants may end up selling goods for prices below what they might have achieved in conventional markets. Merchants also face risks of nonpayment, false bidding, bid rigging, monitoring, transaction fees charged by the auction company, credit card transaction processing fees, and the administration costs of entering price and product information.

AUCTIONS AS AN E-COMMERCE BUSINESS MODEL

Online auctions were among the most successful early business models in retail and B2B commerce. eBay has leveraged the model to also become one of the most successful online retail companies. The strategy for eBay has been to make money off every stage in the auction cycle. eBay earns revenue from auctions in several ways: transaction fees based on the amount of the sale, listing fees for display of goods, financial service fees from payment systems, and advertising or placement fees where sellers pay extra for special services such as particular display or listing services.

However, it is on the cost side that online auctions have extraordinary advantages over ordinary online retailers. Online auction companies carry no inventory and do not perform any fulfillment activities—they need no warehouses, shipping, or logistical facilities: Sellers and consumers provide these services and bear these costs. In this sense, online auctions are an ideal digital business because they primarily involve just the transfer of information.

Even though eBay has been extraordinarily successful, the success of online auctions as an e-commerce business model is qualified by the fact that the online auction marketplace is highly concentrated: eBay dominates, followed by eBid. Many of the smaller online auction companies are not profitable because they lack sufficient sellers and buyers to achieve liquidity. In auctions, network effects are highly influential, and the tendency is for one or two very large online auctions to dominate, with smaller, specialty auctions (which sell specialized goods such as stamps) being barely profitable. In addition, over the years, the popularity of online auctions has significantly declined, with most of the listings on eBay, for example, using posted prices rather than auction pricing. Research indicates that this change has been driven, at least in part, by changes in consumer preferences for convenience and because of increased retail competition (Einav et al., 2018). On the other hand, the Covid-19 pandemic drove traditional high-end auction firms, such as Sotheby's and Christie's, to online, live-streamed auctions, and these are now a common method of firms such as these to conduct auctions (Reyburn, 2020).

TYPES AND EXAMPLES OF AUCTIONS

The primary types of auctions found on the Internet are English auctions, reverse auctions, and so-called penny auctions.

English auction
the most common form of auction; the highest bidder wins

The **English auction** is the easiest to understand and the most common form of auction on eBay. Typically, there is a single item up for sale from a single seller. There is a time limit when the auction ends, a reserve price below which the seller will not sell (usually secret), and a minimum incremental bid set. Multiple buyers bid against one another until the auction time limit is reached. The highest bidder wins the item (if the reserve price of the seller has been met or exceeded). English auctions are considered to be seller-biased because multiple buyers compete against one another—usually anonymously.

reverse auction
an auction where users specify what they are willing to pay for goods or services

In the B2C area, the use of the reverse auction format was pioneered by Priceline, who used it to sell airline tickets, hotel rooms, and vacation packages under the name "Name Your Own Price." In a **reverse auction**, users specify what they are willing to pay for goods or services, and multiple providers bid for their business. Prices do not descend and are fixed: The initial offer is a commitment to purchase at that price.

Priceline successfully offered Name Your Own Price auctions for many years but eventually discontinued the format in 2020. Today, reverse auctions are primarily found in the B2B arena.

So-called penny auctions are really anything but. To participate in a **penny auction** (also known as a **bidding fee auction**), you typically must pay the penny auction company for bids ahead of time, typically 50 cents to $1 dollar, usually in packs costing $25–$50. Once you have purchased the bids, you can use them to bid on items listed by the penny auction (unlike traditional auctions, items are owned by the auction company, not third parties). Items typically start at or near $0, and each bid raises the price by a fixed amount, usually just a penny. Auctions are timed, and when the time runs out, the last and highest bidder wins the item. Although the price of the item itself may not be that high, the successful bidder will typically have spent much more than that price. Unlike a traditional auction, it costs money to bid, and that money is gone even if the bidder does not win the auction. The bidder's cumulative cost of bidding must be added to the final price of a successful bid to determine the true cost of the item. Bidders may find that they spend far more than they intended. Examples of penny auction companies include QuiBids and DealDash.

penny (bidding fee) auction
bidder must pay a non-refundable fee to purchase bids

WHEN TO USE AUCTIONS (AND FOR WHAT)

There are many different situations in which auctions are an appropriate channel for individual sellers or businesses to consider. For much of this chapter, we have looked at auctions from a consumer point of view. The objective of consumers is to receive the greatest value for the lowest cost. Now, switch your perspective to that of a seller or business. Remember that the objective of using auctions is to maximize revenue by finding the true market value of products and services, a market value that hopefully is higher in the auction channel than in fixed-price channels. **Table 11.6** provides an overview of factors to consider.

TABLE 11.6 FACTORS TO CONSIDER WHEN CHOOSING AUCTIONS

CONSIDERATIONS	DESCRIPTION
Type of product	Rare, unique, commodity, perishable
Stage of product life cycle	Early, mature, late
Channel-management issues	Conflict with retail distributors; differentiation
Type of auction	Seller vs. buyer bias
Initial pricing	Low vs. high
Bid increment amounts	Low vs. high
Auction length	Short vs. long
Number of items	Single vs. multiple
Price-allocation rule	Uniform vs. discriminatory
Information sharing	Closed vs. open bidding

The factors are described as follows:

- **Type of product:** Online auctions are most commonly used for rare and unique products for which prices are difficult to discover, and there may have been no market for the goods. However, Priceline has succeeded in developing auctions for perishable commodities (such as airline seats) for which retail prices have already been established, and some B2B auctions involve commodities such as steel.
- **Product life cycle:** For the most part, businesses have traditionally used auctions for goods at the end of their product life cycle and for products where auctions yield a higher price than fixed-price liquidation sales. However, products at the beginning of their life cycle are increasingly being sold at auction. Early releases of music, books, videos, games, and electronics can be sold to highly motivated early adopters who want to be the first in their neighborhood with new products.
- **Channel management:** Manufacturers and retailers must be careful not to allow their auction activity to interfere with their existing profitable channels. For this reason, items offered by manufacturers and established retailers tend to be late in their product life cycle or have quantity purchase requirements.
- **Type of auction:** Sellers obviously should choose auctions where there are many buyers and only a few, or even one, seller. English auctions such as those at eBay are best for sellers because as the number of bidders increases, the price tends to move higher.
- **Initial pricing:** Research suggests that auction items should start out with low initial bid prices to encourage more bidders to bid (see "Bid increments"). The lower the prices, typically the larger the number of bidders. The larger the number of bidders, the higher the prices move.
- **Bid increments:** It is generally safest to keep bid increments low so as to increase the number of bidders and the frequency of their bids. If bidders can be convinced that, for just a few more dollars, they can win the auction, then they will tend to make the higher bid and forget about the total amount they are bidding.
- **Auction length:** In general, the longer auctions are scheduled, the larger the number of bidders and the higher the prices can go. However, once the new bid arrival rate drops off and approaches zero, bid prices stabilize. Most eBay auctions are scheduled for seven days.
- **Number of items:** When a business has a number of items to sell, buyers usually expect a "volume discount," and this expectation can cause lower bids in return. Therefore, sellers should consider breaking up very large bundles into smaller bundles auctioned at different times.
- **Price allocation rule:** Most buyers believe it is "fair" that everyone pays the same price in a multi-unit auction, and a uniform pricing rule is recommended. The idea that some buyers should pay more based on their differential need for the product is not widely supported. Therefore, sellers who want to price-discriminate should do so by holding auctions for the same goods on different auction markets, or at different times, to prevent direct price comparison.
- **Closed vs. open bidding:** Closed bidding has many advantages for the seller, and sellers should use this approach whenever possible because it permits price discrimination without offending buyers. However, open bidding carries the advantage of "herd effects" and "winning effects" (described later in the chapter) in which consumers' competitive instincts to "win" drive prices higher than even secret bidding would achieve.

AUCTION PRICES: ARE THEY THE LOWEST?

It is widely assumed that auction prices are lower than prices in other fixed-price markets. Empirical evidence is mixed on this assumption. There are many reasons why auction prices might be higher than those in fixed-price markets for items of identical quality and why auction prices in one auction market may be higher than those in other auction markets. Consumers are not driven solely by value maximization but instead are influenced by many situational factors, irrelevant and wrong information, and misperceptions when they make market decisions (Simonson and Tversky, 1992). Auctions are social events—shared social environments in which bidders adjust to one another (Hanson and Putler, 1996). Briefly, bidders base their bids on what others have previously bid, and this can lead to an upwardly cascading effect (Arkes and Hutzel, 2000). A study of hundreds of eBay auctionsfound that bidders exhibited **herd behavior** (the tendency to gravitate toward, and bid for, auction listings with one or more existing bids) by making multiple bids on some auctions and making no bids on auctions for comparable items. Herd behavior resulted in consumers paying higher prices than necessary for reasons having no foundation in economic reality (Liu and Sutanto, 2012; Dholakia and Soltysinski, 2001).

herd behavior
the tendency to gravitate toward, and bid for, auction listings with one or more existing bids

The behavioral reality of participating in auctions can produce many unintended results. Winners can suffer **winner's regret**, the feeling after winning an auction that they paid too much for an item, which indicates that their winning bid does not reflect what they thought the item was worth but rather what the second bidder thought the item was worth. Sellers can experience **seller's lament**, reflecting the fact that they sold an item at a price just above the second-place bidder, never knowing how much the ultimate winner might have paid or the true value to the final winner. Auction losers can experience **loser's lament**, the feeling of having been too cheap in bidding and failing to win. In summary, auctions can lead to both winners paying too much and sellers receiving too little. Both of these outcomes can be minimized when sellers and buyers have a very clear understanding of the prices for items in a variety of different online and offline markets.

winner's regret
feeling after an auction that you paid too much for an item

seller's lament
the concern that one will never know how much the ultimate winner might have paid or the true value to the final winner

loser's lament
the feeling of having been too cheap in bidding and failing to win

CONSUMER TRUST IN AUCTIONS

Online auction companies have the same difficulties creating a sense of consumer trust as all other e-commerce companies, although in the case of auction companies, the operators of the marketplace do not directly control the quality of goods being offered and cannot directly vouch for the integrity of the buyers or the sellers. This opens the possibility for criminal or unreliable actors to appear as either sellers or buyers. A number of studies have found that trust and credibility increase as users gain more experience, if trusted third-party seals are present, and if the auction company has a wide variety of consumer services, such as seller feedback ratings and tools for tracking purchases (or fraud), thus giving the user a sense of control Tripathi et al., 2022. Because of the powerful role that trust plays in online consumer behavior, eBay and most online auctions make considerable efforts to develop automated trust-enhancing mechanisms such as seller and buyer ratings, escrow services, buyer and seller insurance, guaranteed-money-back features, and authenticity guarantees (see the next section).

WHEN AUCTION MARKETS FAIL: FRAUD AND ABUSE IN AUCTIONS

Online and offline auction markets can be prone to fraud, which produces information asymmetries between sellers and buyers and among buyers, which in turn causes auction markets to fail. Some of the possible abuses and frauds include:

- **Bid rigging:** Agreeing offline to limit bids or using shills to submit false bids that drive prices up.
- **Price matching:** Agreeing informally or formally to set floor prices on auction items below which sellers will not sell in open markets.
- **Shill feedback, defensive:** Using secondary IDs or other auction members to inflate seller ratings.
- **Shill feedback, offensive:** Using secondary IDs or other auction members to deflate ratings for another user (feedback bombs).
- **Feedback extortion:** Threatening negative feedback in return for a benefit.
- **Transaction interference:** E-mailing buyers to warn them away from a seller.
- **Bid manipulation:** Using the retraction option to make high bids, discovering the maximum bid of the current high bidder, and then retracting the bid.
- **Non-payment after winning:** Blocking legitimate buyers by bidding high, then not paying.
- **Shill bidding:** Using secondary user IDs or other auction members to artificially raise the price of an item.
- **Transaction non-performance:** Accepting payment and failing to deliver.
- **Non-selling seller:** Refusing payment or failing to deliver after a successful auction.
- **Bid siphoning:** E-mailing another seller's bidders and offering the same product for less.

Online auctions have sought to reduce these risks through various methods including:

- **Rating systems:** Previous customers rate sellers based on their experience with them and post these ratings for other buyers to see.
- **Watch lists:** These allow buyers to monitor specific auctions as they proceed over a number of days and pay close attention only in the last few minutes of bidding.
- **Proxy bidding:** Buyers can enter a maximum price they are willing to pay, and the auction software will automatically place incremental bids as their original bid is surpassed.

eBay and many other online auctions have investigation units that receive complaints from consumers and investigate reported abuses. Nevertheless, with millions of visitors per week and hundreds of thousands of auctions to monitor, eBay is highly dependent on the good faith of sellers and consumers to follow the rules.

11.3 E-COMMERCE PORTALS

Port: From the Latin porta*, an entrance or gateway to a locality.*

Portals are among the most frequently visited websites if only because they often are a user's home page: the page to which users point their web browser on startup. The top portals such as Yahoo, MSN, and AOL have hundreds of millions of unique visitors worldwide each month. Portals are gateways to the billions of web pages available on the

Internet. Facebook also acts as a home page portal. Millions of users have set Facebook as their home page, choosing to start their sessions with news from their friends, and many stay on Facebook for several hours a day. We have already discussed Facebook in Section 11.1. Perhaps the most important service provided by portals is to help people find the information they are looking for and, like newspapers, to expose people to information they were not looking for but that they nonetheless may find entertaining or interesting. The original portals in the early days of e-commerce were search engines. Consumers would pass through search engine portals on their way to rich, detailed, in-depth content on the Web. But portals evolved into much more complex websites that provide news, entertainment, images, social networks, in-depth information, and education on a growing variety of topics. Portals today seek to be a sticky destination, not merely a gateway through which visitors pass. In this respect, portals are very much like television networks: destinations for content supported by advertising revenues. Portals today want visitors to stay a long time—the longer, the better to expose visitors to ads. For the most part they succeed: Portals are places where people linger for a long time.

THE GROWTH AND EVOLUTION OF PORTALS

Portals have changed a great deal from their initial function and role. As previously noted, most of today's well-known portals, such as Yahoo, MSN, and AOL, began as search engines. The initial function provided by portals was to index web page content and make this content available to users in a convenient form. Early portals expected visitors to stay only a few minutes. However, as millions of people signed on to the Internet in the early 2000s, the number of visitors to basic search engines exploded commensurately. At first, few people understood how a web search site could make money by passing customers on to other destinations. But search engines attracted huge audiences, and therein lay the foundation for their success as vehicles for marketing and advertising. Search engines, recognizing the potential for commerce, expanded their offerings from simple navigation to include commerce (the sale of items directly from the website as well as advertising for other online retailers), content (in the form of news at first, and later in the form of weather, investments, games, health, and other subject matter), communications (e-mail, chat, and texting), and distribution of others' content. These four characteristics have become the basic definition of a portal.

Because the value of portals to advertisers and content owners is largely a function of the size of the audience that each portal reaches and the length of time visitors stay on the site or app, portals compete with one another on their reach and on the number of unique visitors. *Reach* is defined as the percentage of the audience that visits the site or app in a month (or some other time period), and *unique visitors* is defined as the number of uniquely identified individuals who visit a website or use an app in a month. Portals are inevitably subject to network effects: The value of the portal to advertisers and consumers increases geometrically as reach increases, which, in turn, attracts still more customers. As described in Chapter 3, the top portals/search engines (Google, MSN/Bing, Yahoo, and AOL) account for more than 95% of online searches. A similar pattern of concentration is observed when considering the audience share of portals/search engines, with Google's various sites on both desktop and mobile routinely attracting more than 270 million monthly unique U.S. visitors. However, this picture is changing as

large audiences move to social networks and as millions of users make those networks their opening or home pages and the place where they spend most of their digital time. Social networks like Facebook are broadening their content with videos, movies, and news, transforming themselves into a hybrid social network and portal.

TYPES OF PORTALS: GENERAL-PURPOSE AND VERTICAL MARKET

general-purpose portals
attempt to attract a very large general audience and then retain that audience by providing in-depth vertical content

vertical market portals
attempt to attract highly focused, loyal audiences with a deep interest in community and/or specialized content

There are two primary types of portals: general-purpose portals and vertical market portals. **General-purpose portals** attempt to attract a very large general audience and then retain that audience by providing in-depth vertical content channels, such as information on news, finance, autos, movies, and weather. General-purpose portals typically offer search engines, free e-mail, personal home pages, chat rooms, community-building software, and bulletin boards. Vertical content channels on general-purpose portals offer content such as sports scores, stock tickers, health tips, instant messaging, automobile information, and auctions.

Vertical market portals (sometimes also referred to as vortals) attempt to attract highly focused, loyal audiences with a deep interest in community (affinity group portals) and/or specialized content—from sports to the weather. Vertical market portals have recently begun adding many of the features found in general-purpose portals.

The concentration of audience share in the portal market reflects (in addition to network effects) the limited time budget of consumers. This limited time budget works to the advantage of general-purpose portals. Consumers have a finite amount of time to spend online. Facing limited time, consumers concentrate their visits at sites and apps that can satisfy a broad range of interests, from weather and travel information to stocks, sports, retail shopping, and entertainment content.

General-purpose portals such as Yahoo, AOL, and MSN try to be all things to all people and attract a broad audience with both generalized navigation services and in-depth content and community efforts. For instance, Yahoo has become one of the largest sources of online news. Yet changes in online consumer behavior show that consumers are spending less time "surfing the Web" and browsing and more time doing focused searches, researching, and participating in social networks. These trends will advantage special-purpose, vertical market portals that can provide focused, in-depth community and content.

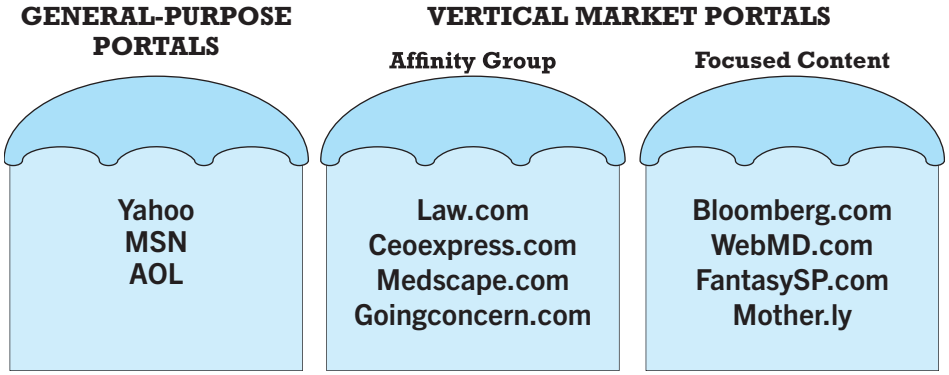
As a general matter, the general-purpose portals are very well-known brands, while vertical market portals tend to be less-well-known brands. **Figure 11.4** lists examples of general-purpose portals and the two main types of vertical market portals.

PORTAL BUSINESS MODELS

Portals receive income from a number of different sources. The revenue base of portals is changing and dynamic, with some of the largest sources of revenue declining. **Table 11.7** summarizes the major portal revenue sources.

The business strategies of both general-purpose and vertical portals have changed greatly because of the rapid growth in search engine advertising and intelligent ad placement networks such as Google's AdSense, which can place ads on thousands of websites based on content. General portals such as AOL and Yahoo did not have well-developed search engines and, hence, did not grow as quickly as Google, which had a powerful search engine. Microsoft, for instance, invested billions of dollars in its Bing search

FIGURE 11.4 TWO GENERAL TYPES OF PORTALS: GENERAL-PURPOSE AND VERTICAL MARKET PORTALS



There are two general types of portals: general-purpose and vertical market. Vertical market portals may be based on affinity groups or on focused content.

engine in order to catch up with Google. On the other hand, general portals had content, which Google did not originally have, although it added to its content by purchasing YouTube and adding Google sites devoted to news, financial information, images, and maps. Facebook users stay and linger on Facebook three times as long as visitors stay and linger on traditional portals like Yahoo. For this reason, social networks, Facebook in particular, are direct competitors of Yahoo, Google, and the other portals.

The survival strategy for general-purpose portals in the future is to develop deep, rich vertical content in order to reach and engage customers. The strategy for smaller, vertical market portals is to put together a collection of vertical portals to form a vertical portal network. The strategy for search engines such as Google is to obtain more content to attract users for a long time and expose them to more ads. For more insight into the current state of affairs with respect to portals, read *Insight on Business: Yahoo and AOL Get Yet Another New Owner*.

TABLE 11.7 TYPICAL PORTAL REVENUE SOURCES

PORTAL REVENUE SOURCE	DESCRIPTION
General advertising	Charging for impressions delivered
Tenancy deals	Fixed charge for guaranteed number of impressions, exclusive partnerships, "sole providers"
Commissions on sales	Revenue based on sales at the site by independent providers
Subscription fees	Charging for premium content
Applications and games	Games and apps are sold to users; advertising is placed within apps

INSIGHT ON BUSINESS

YAHOO AND AOL GET YET ANOTHER NEW OWNER

In the early years of e-commerce, portals were among the most high-profile of business models. In the pre-Facebook era, they were category killers, dominant players. AOL and Yahoo were two of the most prominent. In 2000, Time Warner bought AOL for $168 billion, and Yahoo was worth about $128 billion. However, as the years passed, Google developed a stranglehold on the search market, and social networks such as Facebook largely usurped the role that portals had originally played in online life. Both AOL and Yahoo struggled and undertook various efforts to transform their businesses to make them more relevant. For instance, AOL created or acquired dozens of niche sites such as Engadget, TechCrunch, and the Huffington Post; added video streaming companies and platforms; and created a programmatic online advertising network. Yahoo acquired companies such as Tumblr and Flickr and launched digital magazines like Yahoo Food and Yahoo Tech to curate content from around the Web.

In 2015, Verizon Communications, the U.S. broadband and wireless communications giant, bought AOL for $4.4 billion. Verizon coveted AOL's online audience of 400 million at the time, as well as its digital content and advertising network. In 2017, expanding on this strategy, Verizon purchased Yahoo for $4.5 billion. Yahoo had been largely unsuccessful in developing its own original content but was a king of display ads and supporting technology, with more than 1 billion users worldwide at the time. Verizon initially rebranded its new media division as Oath, an umbrella for Yahoo and AOL, which retained their own brand names. But by the end of 2018, it had become clear that Verizon's initial strategy had failed. In December 2018, Verizon announced a $4.6 billion write-down on the value of Oath, placing it instead at a paltry $200 million. It scrapped the Oath brand, changing it to Verizon Media. It also sold Tumblr, which had been previously acquired by Yahoo for more than $1 billion, to Automattic, the parent of blogging giant WordPress, for a nominal price reported to be $3 million, and sold The Huffington Post, which AOL had purchased, to Buzzfeed.

Verizon Media then tried to deploy a new strategy aiming to diversify its revenue so that ultimately it would be split evenly among advertising, e-commerce transactions, and subscription revenue. The plan harkened back to business models for portals in the early days of e-commerce, where they were envisioned as a one-stop-shop for content, communication, and commerce. To jump-start the plan, Verizon Media rolled out a redesign of Yahoo Mail to include new features that incorporated shopping. Verizon Media hoped to reposition Yahoo Mail as a "one-on-one" e-commerce Inbox. Verizon Media also introduced tools such as a shoppable video player to make it easier for consumers to buy products, and a content management system that made it easier for Verizon Media writers and content producers to embed interactive shoppable products into their stores. Verizon Media also doubled down on live video streaming, taking advantage of Verizon Communications' telecommunications infrastructure, particularly in sports.

Unfortunately, Verizon was not able to successfully execute on this strategy either. In May 2021, Verizon agreed to sell Verizon Media to Apollo Global Management, a private equity company, for $5 billion. Verizon noted that Apollo had a powerful vision that included aggressively

pursuing growth areas in commerce, content, and betting. It pointed with pride to Verizon Media's innovative ad offerings, consumer e-commerce, subscriptions, betting, and strategic partnerships and noted that Yahoo, one of the best-recognized digital media brands in the world, continued to evolve as a key destination for finance and news among Gen Z users, with Yahoo News the fastest-growing news organization on TikTok.

Apollo closed its purchase in September 2021, immediately changing the name of Verizon Media to Yahoo. It stated that it hoped to expand and "rationalize" the business. It pointed to a monthly active user base of around 900 million for Yahoo's different brands, including Yahoo and its various verticals (Yahoo Sports, Yahoo Finance, Yahoo News, Yahoo Entertainment, Yahoo Fantasy, and Yahoo Mail) and fellow portal AOL, as well as focused-content sites such as TechCrunch, Engadget, Autoblog, and Rivals. Yahoo's advertising business was also considered to be an important part of the acquisition. Apollo quickly appointed a new chief executive office, Jim Lanzone, who stated that he saw major opportunities for the company, particularly for Yahoo Sports, Yahoo Finance, and the company's advertising technology segment.

However, many analysts questioned whether it would be possible for Apollo to succeed in rejuvenating Yahoo, AOL, and the portal business model. They pointed to the likelihood that Apollo would instead end up employing a different strategy: breaking Yahoo up and selling its pieces. Early signs that this may in fact be the case have come with the sale of Yahoo's content delivery business, Edgecast, to Limelight, a competitor, for $300 million in March 2022. Around the same time, reports surfaced that Apollo was having preliminary discussions with sport-betting companies about Yahoo Sports, perhaps setting it up for an eventual sale, merger, or spin-off. The Daily Beast, a website focused on politics, media, and pop culture, reported in April 2022 that inside sources claimed Yahoo was in a "shocking" state of disarray and that Apollo was in the process of quietly dismantling Yahoo. A Yahoo spokesperson quickly denied the story, stating that while Apollo was in the early stages of its plans, it believed Yahoo had substantial growth opportunities in which Apollo was continuing to invest.

On a more positive note, Yahoo reported a variety of highlights for 2021. Its various programmatic advertising platforms all achieved positive results, and in May 2022 it announced an exclusive partnership with Marriott International for the launch of the Marriott Media Network, an omnichannel, cross-platform advertising solution for brand advertisers in the travel industry, based on Yahoo's advertising technology. It also launched new ad solutions designed to help advertisers target ads as tracking cookies are phased out. Yahoo is expected to generate more than $5 billion in ad revenues worldwide in 2022. However, whether Apollo can succeed where Yahoo's and AOL's previous owners could not remains to be seen.

SOURCES: "Marriott International Introduces Travel Media Network, Powered by Yahoo," Yahooinc.com, May 16, 2022; "Yahoo Is in a 'Shocking' State of Disarray," by Andrew Kirell and Lachlan Cartwright, Thedailybeast.com, April 12, 2022; "Limelight Acquires Yahoo's Content Delivery Firm from Apollo," by Lamaron Leach and Kiel Porter, Bloomberg.com, March 7, 2022; "Apollo Considers Merging Yahoo Sports with Betting Company, Sources Say," by Alex Sherman, Cnbc.com, March 2, 2022; "Worldwide Yahoo Ad Revenues," Insider Intelligence/eMarketer, March 2022; "Accelerating Yahoo Ad Tech's Global Momentum on the Heels of a Strong 2021," Yahooinc.com, February 3, 2022; "Apollo Taps Tindr CEO Jim Lanzone for Top Yahoo Job," by Benjamin Mullin, *Wall Street Journal*, September 20, 2021; "Yahoo Is Yahoo Once More after New Owners Complete Acquisition," by Jon Porter, Theverge.com, September 2, 2021; "Apollo Completes Its $5B Acquisition of Verizon Media, Now Known as Yahoo," by Brian Heater and Ingrid Lunden, Techcrunch.com, September 1, 2021; "Someone New Thinks They Can Make Yahoo and AOL Good Businesses in 2021," by Joshua Benton, Niemanlab.org, May 3, 2021; "Private Equity Firm Apollo to Buy Verizon Media Assets for $5B, Will Rename Business 'Yahoo,'" by Brian Heater and Ingrid Lunden, Techcrunch.com, May 3, 2021; "Verizon Media to Be Acquired by Apollo Funds," Verizon.com, May 3, 2021; "How Yahoo News Reached 1 Million Followers on TikTok in 1 Year," by Sara Scire, Niemanlab.org, March 10, 2021; "We're Playing Offense: Verizon Pivots Its Publishing Strategy to Focus on Commerce," by Max Willens, Digiday.com, October 21, 2019; "Verizon Announces New Name Brand for AOL and Yahoo: Oath," by Niraj Chokshi, *New York Times*, April 3, 2017; "Verizon Finalizes $4.8 Billion Yahoo Deal," Ryan Knutson and Deepa Seetharaman, *Wall Street Journal*, July 24, 2016.

11.4 CAREERS IN E-COMMERCE

This chapter covers three somewhat different types of e-commerce business models: social networks, auctions, and portals. Of the three, social networks (and associated social marketing) currently offer the most career opportunities, both working for companies that provide social network platforms and working for companies that interact with those platforms. The auction marketspace is dominated by eBay, and there are also job positions available with merchants who sell on eBay. The portal business model currently faces a number of challenges, so career opportunities in that arena are somewhat limited.

In this section, we will take a closer look at a social marketing specialist position for an online retailer. Other job titles in this area might include the terms social marketing or social media in the title, as well as terms such as community/content/digital media/engagement strategist/analyst/manager.

THE COMPANY

The company is an online retailer offering unusual, creatively designed jewelry; art; kitchen goods; and unique foods that cannot be found in traditional department stores. The firm offers artisans and creators of unique goods in an online marketplace. In this online craft fair, the company offers convenience and security to customers and creators of unique goods: a marketplace where they can find customers without traveling to craft fairs and a secure payment environment. The company is in the early stages of building a social marketing program in order to grow its existing online business.

POSITION: SOCIAL MARKETING SPECIALIST

You will be working with the E-commerce Marketing team and reporting to the Director of the E-commerce Team to grow social commerce across multiple channels, primarily Facebook, Instagram, TikTok, and Pinterest. Responsibilities include:

- Testing hypotheses and creating actionable insights based on creative social network campaigns
- Reporting the results of these experiments to the Team and recommending new strategies to reach our customers
- Authoring weekly social media reports on the results of social marketing for sales
- Working with other departments (e.g., product development, creative, and merchandising) to ensure goal and strategy alignment as well as to maintain brand identity
- Structuring in-depth, ad hoc analyses to uncover trends and patterns in social media
- Auditing social network measurement and listening tools
- Providing recommendations on necessary tool sets to measure advertising effectiveness and to drive insights
- Analyzing competitor performance and results to inform in-house strategy

QUALIFICATIONS/SKILLS

- BA/BS in digital marketing, management information systems, e-commerce, business, or behavioral science
- Course work in social network/digital marketing and/or statistics
- Experience with e-commerce and some form of social marketing
- Experience using various social networks
- Graphics, digital video, and photography a plus but not required
- Moderate to advanced Excel experience
- Excellent writing, communication, and collaboration skills
- An eye for good design
- A passion for social marketing and advertising
- Familiarity with Ads Manager tools for Facebook, Instagram, TikTok, and Pinterest, as well as analytics tools for each platform

PREPARING FOR THE INTERVIEW

To prepare for the interview, do background research on the company and in particular, the niche retail space of artisanal goods, antiques, and collectables. What are the challenges posed by this marketplace? Visit the website of the firm, and its social media postings, to identify the major branding themes the firm uses to attract customers and suppliers of unique goods. Do searches on social media to discover what others are saying about the firm and its products.

Then review Section 11.1 of this chapter. Doing so will help you to demonstrate that you are familiar with the major social networks in the United States and the different ways to measure their relative influence (such as number of unique visitors, time spent, and advertising revenue). You should be familiar with the fact that most social network users access social networks via mobile devices. Also review the section on social network technologies and features and Table 11.4 so that you can speak about these topics in an informed manner.

Before the interview, you should also think about where your background, such as courses taken, outside experience with social networks, and your own personal interests, can be useful to the firm.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. How would you compare Facebook with Pinterest as social networks where we could build an online audience for our products?

You could describe the differences between Facebook and Pinterest and talk about how each can be used for somewhat different purposes. For instance, Pinterest is an ideal location for pictures of the firm's offerings. Facebook would score high as a place to recruit new artists as well as to display items for sale and garner feedback from customers.

2. Given the nature of our products and customers, what kinds of social networks should our firm be using besides Facebook, Instagram, TikTok, and Pinterest?

Here you could describe how interest- and affinity-based networks such as DeviantArt and Worthpoint can reach out to small but highly engaged interest and affinity communities.

3. What kind of experience have you had with tools for measuring the effectiveness of social marketing?

You can prepare for this question by reviewing material on ways to measure user engagement. If you have some experience in social network marketing, be prepared to discuss what role you played in measuring the success of social marketing campaigns.

4. Have you used a statistical analysis package to do research on quantitative data?

You can prepare for questions like this by taking courses in marketing or statistics and by learning how to use statistical packages like SAS or SPSS for analyzing data. You may have used Google Analytics software to track campaigns. You may also have experience using simple Excel spreadsheets to track impressions and responses to marketing campaigns.

5. Are you familiar with the various social network ad management tools? Have you ever used such tools to create ads and measure their success?

You can prepare for questions like this by doing research on Facebook's, Instagram's, TikTok's, and Pinterest's Ad Manager tools, as well as various analytics packages for each of these social networks. Virtually all ad platforms make available online packages for tracking the responses to online campaigns on their platform.

6. What kinds of projects have you worked on that involve photo and video editing and graphics? Have you created online ads?

You can start by reviewing the firm's use of photos and videos (if any) and point out the growing use of videos to market products on virtually all the large social network platforms. Given the nature of this firm and its products, you can prepare for this question by assembling a portfolio of photos, videos, and graphics that you have created and then describe how your interests will fit the firm's social network marketing strategy.

11.5 CASE STUDY

eBay:
Refocusing on Its Roots and Embracing Recommerce

eBay began business under the name AuctionWeb in 1995 as an offbeat, quirky place for consumers to buy and sell almost anything to one another via online auctions. In 1998, eBay went public, with founder Pierre Omidyar and company officials crediting the Beanie Babies craze of the late 1990s for introducing people to the platform. But, after rapid growth, the auction model began to struggle. For many buyers, the novelty of online auctions had worn off, and they began to prefer the simplicity of buying goods from Amazon and other fixed-price retailers. Search engines and comparison-shopping sites were also taking away some of eBay's auction business by making items easier to find online.

Former CEO John Donahoe instituted a revival plan that moved eBay away from its origins as an online flea market and partnered with retail chains to serve as another channel for current merchandise. The small sellers who had driven eBay's early growth were encouraged to shift away from the auction format and move toward the fixed-price

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sales model. eBay adjusted its fees and revamped its search engine to incentivize fixed-price sales. Rather than displaying auctions that were close to finishing at the top of search results, eBay tweaked its search tool to account for price and seller reputation so that highly rated merchants appeared first and received more exposure. The auctions that once powered eBay's results have now taken a back seat to fixed-price, "Buy It Now" listings. In 2022, eBay typically has about 1.6 billion listings on any given day, of which auctions comprise perhaps only about 10%.

From its beginning, eBay also invested in what it considered to be related lines of business. For instance, in 2002 it acquired PayPal, an innovative online payment processor that many consumers used for their eBay transactions, for $1.5 billion. It also acquired 25% of Craigslist, which operates a C2C classifieds website, in 2004, and thereafter acquired a number of other businesses in the classifieds market, such as Gumtree and Motors.co.uk. It purchased VoIP platform Skype in 2005 for $3 billion, based on the premise that Skype would increase eBay's transaction volume by making it easier for buyers and sellers to talk to one another. It purchased StubHub, the online ticket reseller, for $310 million in 2007. In addition, it purchased GSI Commerce, which specialized in creating, developing, and running online shopping sites for bricks-and-mortar retailers in 2011 for $2.4 billion, and shortly thereafter purchased Magento, an e-commerce software platform, and merged the two together into a new eBay division it named eBay Enterprises.

Now, fast-forward to 2022. eBay no longer owns or operates any of those businesses: It has divested itself of them at various times through the years, sometimes for a profit and sometimes not. The eBay of today has decided instead to refocus on its roots: running a marketplace featuring unique selections and great values, with renewed attention on collectibles such as trading cards, watches, and sneakers that attract enthusiast buyers. Chief Executive Officer Jamie Iannone, who took the helm in 2020, has said that his plan is to center on eBay's "core" and on its individual sellers and enthusiast buyers, who currently are responsible for 70% of the gross merchandise value (GMV) transacted on the eBay platform. eBay is also returning to its roots in embracing the recommerce and circular economy movement.

Recommerce involves the buying and selling of pre-owned goods and is an integral part of the concept of a circular economy, which involves creating an economic system that reduces waste by keeping products and materials in use for a longer period of time. A more circular economy is expected to bring a range of benefits.

Interest in recommerce and the circular economy is being driven in part by members of the Gen Z and Millennial generations. According to a recent eBay survey, about 80% of both Gen Z and Millennials who were surveyed purchased used goods in the past year, with many saying that they do so not only for financial reasons but also because it aligns with their values with respect to sustainability, reduced waste, and the environment.

eBay views itself as a key player in the circular economy and considers itself a pioneer in recommerce. Purchases of pre-owned electronics and apparel on eBay's various platforms reduced carbon emissions by approximately 4.6 million metric tons between 2016 and 2021. By 2025, eBay hopes to further reduce carbon emissions by 7 million metric tons and also eliminate 230,000 metric tons of waste via recommerce. Major recommerce categories on eBay include electronics, apparel, collectibles, books, and toys.

Throughout the years since its inception, eBay has continually invested in technology to enhance both the selling and the buying experiences. eBay positioned itself well for the future with its early embrace of the mobile platform, even before the iPhone hit the market. This prescience resulted in eBay achieving its 100 millionth app download and its 100 millionth mobile listing very early, in 2012. eBay continues to make improvements to the mobile experience on many platforms and across all of its different services. eBay has also integrated "progressive app" features into its existing mobile infrastructure, which makes it function more like a native app, requiring less data to operate and allowing users to access many features even while offline. eBay has a native app for eBay Motors, built with cutting-edge technology including artificial intelligence, machine learning and Flutter, an open-source, cross-platform development platform.

eBay is also using machine learning to customize, update, and generally improve its product pages as well as to fine-tune its search capability beyond simply matching search terms with keywords and tags. eBay offers two types of image search: one where you can take a picture or upload a picture from a smartphone to find items that match those seen in the photo, and the other, called Find it on eBay, which allows users to do the same type of search with images found online. Machine learning powers and improves both forms of visual search. eBay also redesigned its website's interface to emphasize images over text and to allow users to perform visual searches for the items they are interested in. In addition, eBay has dramatically improved the accessibility of its website, which can now be navigated without a mouse and is far easier to use with screen-reading software used by visually impaired shoppers.

The company's Seller Hub offers many analytical tools and metrics to sellers, including inventory, order, and listing management; performance insights; and streamlined business process management. A new unified listing experience offers an intuitive and cohesive design across all of eBay's platforms, simplifying the listing eBay has also launched personalized tools, such as coded coupons, that make it possible for sellers to personalize and distribute offers to their target customers. In addition, all Seller Hub users are able to access Terapeak Product Research for free, providing pricing insights and listing quality reports.

eBay has also cracked down on fraud on the part of both buyers and sellers, one of the most common concerns about using eBay. To limit seller fraud, eBay is now authenticating items that are commonly counterfeited, such as watches, handbags, and trading cards. Sellers can pay for the authentication service to increase their appeal to buyers, and buyers can pay to guarantee that their purchases will be voided if the product turns out to be counterfeit. To further strengthen buyer confidence, eBay offers a money-back guarantee, which allows buyers to get their money back if the item they ordered does not arrive, is faulty or damaged, or does not match the listing.

eBay's relationship with PayPal is an important part of the eBay story. Revenues from PayPal supported eBay through a number of lean years. In 2015, eBay elected to spin off PayPal as its own separate company. Although eBay's leadership had resisted a spinoff for years, the move was prompted by PayPal's desire to become more agile within the rapidly developing marketplace of online payments. As part of the split, eBay agreed to initially route 80% of its transactions through PayPal and to continue to use PayPal as its back-end payment provider. However, that agreement ended in 2020, with eBay

SOURCES: "eBay Wants to Become the Marketplace of Choice for Collectors," by Rachel Wolff, Insider Intelligence/eMarketer, May 24, 2022; "eBay Releases Methodology for Calculating Environmental and Financial Benefits of Recommerce and 2021 Impact Report," Eseller356.com, May 18, 2022; "eBay, Inc. Reports Better than Expected First Quarter 2022 Results," Prnewswire.com, May 4, 2022;""eBay Sales Fall as GMV Declines for Fourth Consecutive Quarter," by Paul Conley, Digitalcommerce360.com, May 4, 2021; "eBay, Inc. (EBAY) CEO Jamie Iannone on Q1 2022 Results—Earnings Call Transcript," Seekingalpha.com, May 4, 2022; "eBay Launches Imperfect Initiative to Sell Flawed Fashion," by Bella Webb, Voguebusiness.com, April 20, 2022; "eBay CEO Jamie Iannone Discusses Latest Recommerce Report," by Liz Morton, Valueaddedresource.net, April 8, 2022; "eBay Vault Will Help the Collectibles Giant Compete with Emerging Investing Players," by Tom Auchterlonie, Insider Intelligence/eMarketer, April 8, 2022; "Recommerce Report," by eBay, April 2022; "eBay Fast Facts," Ebayinc.com, March 31, 2022; "eBay to Add Crypto Payment Options," Thepaypers.com, March 2, 2022; "eBay, Inc. Form 10-K for the Fiscal Year Ended December 31, 202021," Sec.com, February 24, 2022; "eBay and the Circular Economy," Ebaymainstreet.com, November 2021; "After the Beanie Baby Bubble Burst," by Emily Stewart, Vox.com, January 12, 2022; "eBay's Survival Lesson," by Shira Ovide, *New York Times*,

August 11, 2021;"eBay Motors: Accelerating with Flutter," by Corey Sprague and Larry McKenzie," Tech.ebayinc.com, September 8, 2021; "Is eBay Going to Eliminate Auctions," by Ira Steiner, Ecommercebytes.com, April 12, 2021; "eBay Debuts reCommerce Marketplace," Pymnts.com, October 21, 2020; "Ayden Says It's Ready to Take on the Majority of eBay's Volume Next Year," by John Stewart, Digitaltransactions.com, August 23, 2019; "Artificial Intelligence and Marketplaces: Who's Doing It, Why, and How," by AIM Group, Aimgroup.com, July 9, 2019; "EBay Selects Apple Pay as Its First Post-PayPal Payment Option," by Jake Krol, Mashable.com, July 24, 2018; "EBay Is Exploring Offline Access with a Progressive Web App," by Paul Sawers, Venturebeat.com, May 10, 2018; Jason Del Rey, "After 15 Years, eBay Plans to Cut Off PayPal as Its Main Payments Processor," Recode.net, January 31, 2018; "eBay to Launch Visual Search Tools for Finding Products Using Photos from Your Phone or Web," by Sarah Perez, Techcrunch.com, July 26, 2017; "For eBay, AI Is Ride or Die," Venturebeat.com, July 8, 2017; "At eBay, Machine Learning Is Driving Innovative New Approaches to Search Experiences," by Sebastian Rupley, Ebayinc.com, August 22, 2016; "Replatforming eBay: How We Are Delivering the Shopping Destination of Choice," by Steve Fisher, Ebayinc.com, July 14, 2015; "eBay Hits 100M Mobile App Download Mark," by Dervedia Thomas, Dailydealmedia.com, September 29, 2012; "Behind eBay's Comeback," by James B. Stewart, *New York Times*, July 27, 2012.

instead selecting Dutch payments company Adyen for its back-end payment service. While PayPal is still a payment option for eBay customers, eBay now has far more control over the checkout process and can charge fees that were traditionally collected by PayPal. In 2021, eBay completed the migration of its payment processing from PayPal to Adyen and pointed to this as a main source of increased net revenue in 2021. eBay has now added a number of different payment options for its customers, including Apple Pay, Google Pay, and in certain markets, Klarna and Afterpay. eBay is also reportedly exploring cryptocurrencies as a payment option and is testing a new digital wallet.

eBay has additionally taken a number of steps to support recommerce. In 2020, it launched eBay Refurbished, a marketplace for businesses to offer a wide variety of refurbished electronics, home and garden products, sporting goods, and beauty products. eBay Refurbished products are backed by a one-to-two-year warranty, are inspected prior to being offered, and generally come with a 30-day return policy, with free returns and shipping. Sellers are vetted by eBay to make sure they meet strict performance requirements. In 2022, eBay.co.uk launched Imperfects, which offers a range of clothing, shoes, and accessories that are new but have minor defects that prevent them from being sold at full price by their manufacturers. eBay has also launched a series of new initiatives to boost its appeal with respect to collectibles. For instance, in the second quarter of 2022, it plans to unveil eBay Vault, a collectibles trading marketplace that will enable faster transactions and include the physical storage of goods. Initially, it will focus on trading cards, with plans to add luxury goods at a later date.

However, in 2022, eBay faces both challenges and potential opportunities. The amount of GMV it generated in 2021 ($87 billion) was flat compared to the GMV it generated in 2020, and the number of active buyers declined from 185 million at the end of 2020 to 147 million at the end of 2021. The number of sellers also declined, from 19 million to 17 million. For the first quarter of 2022, GMV and the number of active buyers declined for a fourth consecutive quarter, and eBay recorded a $1.3 billion loss compared to a $641 million profit in the first quarter of 2021. But Iannone remains confident in eBay's long-term strategy. He attributes the decline in eBay's results to what he categorized as "near-term headwinds," such as consumers returning to stores after the Covid-19 pandemic and rising inflation. And although auctions are not likely to ever have as preeminent a place in eBay's business model as they once did, it's possible that as eBay continues to focus on recommerce and collectible items, auctions may also experience a resurgence, as the auction format is uniquely suited for those types of goods.

Case Study Questions

1. Contrast eBay's original business model with its current business model.
2. What are the problems that eBay is currently facing? How is eBay trying to solve these problems?
3. Investigate eBay's current performance. Has eBay's new strategy worked? Why or why not?

11.6 REVIEW

KEY CONCEPTS

■ Describe the different types of social networks and online communities and their business models.

- Social networks involve a group of people, shared social interaction, common ties among members, and a shared area for some period of time. An online social network is one where people who share common ties can interact with one another online. Top online social networks include Facebook, Instagram, TikTok, Twitter, Pinterest, Snapchat, and LinkedIn.
- The different types of social networks and communities and their business models include:
  - *General communities:* Members can interact with a general audience segmented into numerous different groups. Most general communities began as non-commercial, subscription-based endeavors, but many have been purchased by larger community portals.
  - *Practice networks:* Members can participate in discussion groups and get help or information relating to an area of shared practice, such as art, education, or medicine. These generally have a nonprofit business model in which they simply attempt to collect enough in subscription fees, sales commissions, and limited advertising to cover the cost of operations.
  - *Interest-based communities:* Members can participate in discussion groups focused on a shared interest. The advertising business model has worked because the targeted audience is attractive to marketers. Tenancy and sponsorship deals provide another similar revenue stream.
  - *Affinity communities:* Members can participate in focused discussions with others who share the same affinity or group identification. The business model is a mixture of subscription revenue from premium content and services, advertising, tenancy/sponsorships, and distribution agreements.
  - *Sponsored communities:* Members can participate in online communities created by government, nonprofit, or for-profit organizations for the purpose of pursuing organizational goals. They use community technologies and techniques to distribute information or extend brand influence.

■ Describe the major types of auctions, their benefits and costs, how they operate, when to use them, and the potential for auction abuse and fraud.

- Online auctions are markets where prices vary (dynamic pricing) depending on the competition among the participants who are buying or selling products or services. The most common are C2C auctions. There are also numerous B2B online auctions.
- There are several major auction types that are classified based upon how the bidding mechanisms work in each system:
  - *English auctions:* A single item is up for sale from a single seller. Multiple buyers bid against one another within a specific time frame, with the highest bidder winning the object as long as the high bid has exceeded the reserve bid set by the seller, below which the seller refuses to sell.
  - *Reverse auctions:* Buyers specify the price they are willing to pay for an item, and multiple sellers bid for their business. This is one example of discriminatory pricing, in which winners may pay different amounts for the same product or service depending on how much they have bid.
  - *Penny (bidding fee) auctions:* Bidders pay a non-refundable fee to purchase bids.
- Benefits of auctions include: liquidity, price discovery, price transparency, market efficiency, lower transaction costs, consumer aggregation, network effects, and market-maker benefits.

- Costs of auctions include: delayed consumption, monitoring costs, equipment costs, trust risks, and fulfillment costs.
- Auction sites have sought to reduce these risks through various methods including rating systems, watch lists, and proxy bidding.
- Auctions can be an appropriate channel for the sale of items in a variety of situations. The factors to consider include the type of product, the product life cycle, channel management, the type of auction, initial pricing, bid increments, auction length, number of items, price allocation, and closed versus open bidding.
- Auctions are particularly prone to fraud, which produces information asymmetries between buyers and sellers. Some of the possible abuses and frauds include bid rigging, price matching, defensive shill feedback, offensive shill feedback, feedback extortion, transaction interference, bid manipulation, non-payment after winning, shill bidding, transaction non-performance, non-selling sellers, and bid siphoning.

■ Describe the major types of Internet portals and their business models.

- Portals are gateways to billions of web pages available on the Internet. Originally, their primary purpose was to help users find information on the Web, but they evolved into destinations that provided a myriad of content from news to entertainment. Today, portals serve four main purposes: navigation of the Web (search), content, commerce, and communication.
- Among the major portal types are:
  - *General-purpose portals:* Examples include AOL, Yahoo, and MSN, which try to attract a very large general audience by providing many in-depth vertical content channels. Some also offer search engines, e-mail, chat, bulletin boards, and personal home pages.
  - *Vertical market portals:* Also called vortals, they attempt to attract a highly focused, loyal audience with an intense interest in either a community they belong to or an interest they hold. Vertical market portals can be divided into two main classifications, affinity group portals and focused content portals, although hybrids that overlap the two classifications also exist.
- Portals receive revenue from a number of different sources including general advertising, tenancy deals, subscription fees, and commissions on sales.
- The survival strategy for general-purpose portals is to develop deep, rich vertical content in order to attract advertisers to various niche groups that they can target with focused ads. The strategy for the vertical market portals is to build a collection of vertical portals, thereby creating a network of deep, rich content sites for the same reason.

QUESTIONS

1. What do social networks, auctions, and portals have in common?
2. What are the four defining elements of a social network—online or offline?
3. Why is Pinterest considered a social network, and how does it differ from Facebook?
4. What are three mobile social networks?
5. Why are mobile social networks growing so quickly?
6. What are two measures that can be used to understand the importance of social networks and to compare them to other Internet experiences?
7. What is an affinity community, and what is its business model?
8. List and describe four different types of auctions.
9. What is the difference between a C2C and a B2B auction?
10. How does a reverse auction work?
11. List and briefly explain three of the benefits of auction markets.
12. What are the four major costs to consumers of participating in an auction?

13. What are some of the risks of penny (bidding fee) auctions?
14. What is herd behavior, and how does it impact auctions?
15. Name and describe five types of possible abuses and frauds that may occur with auctions.
16. What types of products are well suited for an auction market? At what points in the product life cycle can auction markets prove beneficial for marketers?
17. What three characteristics define a portal today?
18. What are the two main types of vertical market portals, and how are they distinguished from one another?
19. List and briefly explain the main revenue sources for the portal business model.
20. Why have online auctions declined in popularity compared to the early years of e-commerce?

PROJECTS

1. Find two examples of an affinity portal and two examples of a focused-content portal. Prepare a presentation explaining why each of your examples should be categorized as an affinity portal or a focused-content portal. For each example, surf the portal and describe the services it provides. Try to determine what revenue model each of your examples is using and, if possible, how many members or registered users the portal has attracted.
2. Examine the use of auctions by businesses. Go to any online auction of your choosing and look for outlet auctions or auctions directly from merchants. Research at least three products for sale. What stage in the product life cycle do these products fall into? Are there quantity purchasing requirements? What was the opening bid price? What are the bid increments? What is the auction duration? Analyze why these firms have used the auction channel to sell these goods, and prepare a short report on your findings.
3. Visit one for-profit and one nonprofit sponsored social network. Create a presentation to describe and demonstrate the offering at each social network. What organizational objectives is each pursuing? How is the for-profit company using community-building technologies as a customer relations management tool?
4. Visit one of the social networks listed in Table 11.1, and compare it to Facebook. In what ways is it similar to Facebook, and in what ways is it different? Which do you prefer, and why?

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CHAPTER 12

B2B E-commerce: Supply Chain Management and Collaborative Commerce

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

12.1 Discuss the evolution and growth of B2B e-commerce, as well as its potential benefits and challenges.

12.2 Understand how procurement and supply chains relate to B2B e-commerce.

12.3 Identify major trends in supply chain management and collaborative commerce.

12.4 Understand the different characteristics and types of B2B e-commerce marketplaces.

12.5 Understand the objectives of private B2B networks, their role in supporting collaborative commerce, and the barriers to their implementation.

NEW Video Cases

See **eText Chapter 12** to watch these videos and complete activities:

12.1 Apple and Supply Chain Disruption

12.2 Ramp Helps Businesses with Procurement Processes

Amazon Business:

Amazon Takes on B2B

We all know Amazon as the mecca of online shopping for consumers. Amazon offers its retail customers unparalleled selection, speed, customer service, and price. As a result, Amazon has become, by far, the world's largest online retailer, generating more than $590 billion from retail e-commerce sales worldwide in 2021. Companies that employ Amazon as a platform to sell goods (third-party sellers) accounted for more than 50% of the units sold on Amazon. Most use Amazon's Fulfillment by Amazon (FBA) service, which warehouses the products prior to sale and then fulfills orders using Amazon's payment and delivery systems. Few Amazon shoppers know that Amazon is also the largest provider of cloud computing services via Amazon Web Services ($62 billion in revenues in 2021), a business that it started in 2006.

Even less well-known is that Amazon is now leveraging its experience and computing platform by providing a B2B marketplace named Amazon Business, aimed at becoming for businesses what it has already become for consumers—an extraordinarily convenient shopping experience for just about everything businesses want to buy, and an equally valuable tool for businesses of all sizes to sell to other businesses. In its first year of operation, Amazon Business hit $1 billion in B2B sales and quickly amassed a customer list of 400,000 buyers, adding approximately 100,000 new customers per quarter. Amazon Business now generates more than $30 billion in gross merchandise volume (GMV), is used by more than 5 million businesses (ranging from sole proprietors to multinational enterprises with thousands of employees on a single account) and by hundreds of thousands of business sellers, and has more than 56 million items for sale, everything from office products, computers, and software to industrial parts, janitorial supplies, medical instruments, and hospital supplies. In fact, many of the products available on Amazon's retail site are also available on Amazon Business, often with quantity discounts. The only requirement for buyers is that they have to prove they are associated with a real business.

B2B is not a totally new arena for Amazon. Amazon entered the B2B space in 2005 with the purchase of Small Parts, a firm aimed at selling B2B niche products. Amazon's own research found that millions of its Amazon customers were, in fact, business purchasers who were not well served by the retail market aimed at consumers. Amazon rebranded Small Parts in 2012 as AmazonSupply after broadening the product mix to more than 2.5 million products, identifying specific industries to target, and developing support services like credit payment and consolidated invoicing systems desired by sellers and buyers. However, the market response

was tepid. AmazonSupply was just another single-vendor firm (Amazon) offering its catalog to businesses. There were plenty of competitors who had run online supply houses for decades, with millions of loyal business customers.

In 2015, Amazon rebranded the site again as Amazon Business, adding millions of business-specific products and welcoming third-party vendors onto the platform. In doing so, Amazon made the transition from being just another distributor of supplies to a real marketplace. Sellers on Amazon Business are required to have a Professional selling plan, with a monthly subscription fee, to participate on the platform. Amazon also charges third-party vendors a referral fee, or commission on sales, depending on the category of goods sold. For instance, for personal computers, where margins are historically thin, Amazon charges 8%, compared to industrial and scientific products, where its commission is 12%. Additional fees apply for sellers using the FBA program. Today, Amazon Business serves 80% of the Fortune 100 companies, more than 90% of the 100-largest hospitals, 90% of the governments serving the 100-largest U.S. cities and counties, as well as the governments of 45 of the 50 states.

There are significant advantages to both buyers and sellers who use Amazon Business: Buyers get access to a powerful product search engine; choices from multiple providers; the ability to consolidate purchases from multiple vendors at a single location; payment systems; buyer-seller messaging; the ability to designate multiple corporate purchasing agents; reporting and control over employee purchases; bulk discounts; and detailed product specifications to ensure the purchased products meet corporate and government standards (such as ISO 9000 certifications). Other B2B services that help both sellers and buyers are credit lines, sales tax exemption, a 365-day return policy, and, after partnering with Visa, the ability to easily track items purchased on Visa company credit cards. Buyers also can become Amazon B2B Prime customers and get free two-day shipping. Not least, buyers get an Amazon-style interface that is easy to understand and navigate.

For third-party sellers, the advantages of selling on Amazon Business include scalability of marketing at a single site; global reach; communications with customers; predictable customer acquisition costs; a sales reporting system; and visibility into customer buying patterns. Using FBA, sellers reduce the hefty costs of warehousing the products they sell, although Amazon does charge a fee for warehousing third-party products. For large firms, Amazon Business will integrate its purchase system with the firms' own enterprise procurement software. For B2B sellers, payment has always been a risk, especially for international purchases. However, Amazon offers a payment escrow service that minimizes the payment risk. Most traditional B2B distributors do not offer all these services for buyers and sellers.

There are few, if any, downsides in Amazon Business for buyers. There's plenty to like about a "neutral," transparent marketplace where thousands of vendors offer competing products, and where there are plenty of purchaser support programs and services, all delivered in a very user-friendly online environment typical of Amazon for retail consumers. Companies with unique needs for goods and services are signing up for Amazon Business in droves. Amazon has focused on capturing "tail spend," or the portion of business spending that is not routinely ordered from traditional suppliers. This is estimated to be as much as 20% of all business spending. As a result, Amazon's product catalog is so diverse that its more traditional competitors can't compare.

For sellers, however, it's a different story. Sellers want to "own" and build a relationship with their customers so that the sellers can develop targeted marketing programs, improve

SOURCES: "Selling on Amazon Business," Sellercentral.amazon.com, accessed April 27, 2022; "How Digital Procurement with Amazon Business Cultivates

the relationship, and build long-term loyalty (known as branding). A single-shot sale to a customer may lose money, but the hope is to develop long-term customer purchases. But businesses who sell through Amazon Business must forego this approach. Amazon Business owns the customer, and vendors are prohibited from marketing and selling to customers directly "off-market." The brand is Amazon, not the seller's brand. Price transparency is a real liability for sellers because it prevents them from using price discrimination in their marketing, or uniquely branding their products and services as somehow differentiated. In a transparent market, especially for commodity items, profits are meager. Businesses also have to closely coordinate their Amazon Business store with their own websites. For instance, they may not be able to offer special discounts on their websites without also offering these discounts on Amazon Business. The fees charged by Amazon Business for placement and fulfillment also reduce profits for sellers. The interest of B2B marketplaces is to make money from handling transactions, not to make sales profitable for participating sellers. On the other hand, Amazon Business cannot keep expanding if third-party sellers are losing money. However, so far, these apparent disadvantages have not prevented thousands of sellers from joining Amazon Business.

Amazon Business is already putting major pressure on many of its biggest competitors, whether they be similar B2B marketplaces such as that offered by Grainger, or office supply retailers like Office Depot/Office Max. The company continues to aggressively market Amazon Business. It offers Business Prime Shipping capability, similar to its Amazon Prime subscriptions for retail customers, with different tiers of service ranging from just $69 per year to $10,000 per year for large organizations. Nearly half of Amazon Business customers report that they plan to increase their spending on the platform, making matters worse for these competitors. Although sellers may balk at losing out on their direct relationships with customers by selling through the Amazon platform, they may soon feel forced to use Amazon Business or suffer dramatic drops in sales. This also applies to many companies outside the United States. Since launching in the United States in 2015, Amazon Business has expanded to eight additional countries, including Germany, the United Kingdom, India, Japan, Italy, Spain, France and Canada.

Amazon is also focusing on attracting more buyers to its platform. For instance, research has shown that almost 70% of business buyers consider sustainability performance in supplier selection, but struggle to find the right suppliers. Amazon Business has made sustainability a priority, offering more than 200,000 products that are Climate Pledge Friendly. Amazon Business Prime members can use Guided Buying, a tool that allows procurement administrators to identify preferred products, sellers, or certification categories for their authorized buyers. Guided Buying enables companies to direct their buyers to Climate Pledge Friendly products. Amazon Business's Product Search API can integrate into companies' procurement software, enabling buyers to easily find and order sustainable supplies.

Amazon views Amazon Business as a significant part of its future, on par with its e-commerce retail segment, Amazon Prime, and Amazon Web Services. Amazon Business is Amazon's fastest-growing segment, growing at a rate faster than Amazon itself. Analysts estimate that it will generate more than $35 billion in GMV by 2022, up from $10 billion in 2018. As Amazon Business gains more momentum, its competitors, including Grainger, Office Depot/Office Max, Staples, Walmart, Costco, and eBay, should be very concerned.

More Sustainable Supply Chains," Supplychaindive.com, April 25, 2022; "How Distributors Can Self-Disrupt to Win in the New Digital World, by Alex Abdelnour, Brooke Daniels, Steve Reis, and Kevin Sachs, Mckinsey.com, March 31, 2022; "Amazon Business Has Grown about 50% Each Year since 2019," by Sara Lebow, Emarketer.com, September 21, 2021; "Amazon Business Keeps Growing Faster than Amazon," Digitalcommerce360.com, April 12, 2021; "A Wall Street Analyst Predicts a More Dominant Future for Amazon Business," Digitalcommerce360.com, April 2, 2021; "Amazon Business Exceeds $25 Billion in Annualized Sales," Digitalcommerce360.com, March 15, 2021; "Shedding New Light on How to Win against Amazon Business," by Peter Lucas, Digitalcommerce360.com, May 27, 2020; "Amazon Business Bent on Being the Go-To B2B Platform," by Denise Power, Uschamber.com, July 16, 2019; "Amazon's B2B Marketplace Advantage," by Alex Moazed and Nicholas L. Johnson, Mdm.com, June 28, 2018; "Lessons from Amazon's Entry into B2B," by Kristin Swenson, Netsuiteblogs.com, May 22, 2018; "Q&A: Inside Amazon Business with Martin Rohde," Digitalcommerce360.com, May 2, 2018; "Why Amazon Business Targets B2B eCommerce's 'Tail Spend'," Pymnts.com, May 1, 2018; "Amazon's Next Mountain: B2B Procurement," by Qasim Mohammad, Theglobeandmail.com, January 7, 2018; "What Amazon Business Can Teach Us about B2B eCommerce," Oroinc.com, November 8, 2017; "Amazon Takes on Office Supply Retailers with Launch of Business Prime Shipping," by Sarah Perez, Techcrunch.com, October 24, 2017; "Pros and Cons of Selling on Amazon Business," by Lori McDonald, Practicalecommerce.com, June 21, 2017; "Amazon Business: Understanding the Threat to B2B Distributors," by Nicholas L. Johnson, Applicoinc.com, April 14, 2017; "Amazon Expands Business-Sales Marketplace after Three Years," by Greg Bensinger, *Wall Street Journal*, April 28, 2015.

The Amazon Business case illustrates the exciting potential for e-commerce technologies and customer experience to move from the consumer sphere to the business-to-business (B2B) world, where companies buy from hundreds or even thousands of suppliers and in turn, sell to hundreds or potentially thousands of distributors and retailers.

This case frames the two sides of B2B e-commerce: the supply (buy) side and the sell side. On the supply side, firms have developed elaborate systems and techniques over many decades in order to manage their supply chains and the procurement process. Large firms can easily have hundreds or even thousands of suppliers of parts and materials. These are referred to as supply chain systems, which are described further in this chapter. These supply chain systems lower production costs, increase collaboration among firms, speed up new product development, and ultimately have revolutionized the way products are designed and manufactured. For instance, in the fashion industry, the combination of high-speed Internet-enabled supply chains coupled with equally high-speed trendy design not only clears shelves (and reduces the likelihood of clearance sales) but also increases profits by increasing value to consumers.

The success of Amazon Business provides insight into the sell side of B2B e-commerce. All the techniques of marketing, branding, and fulfillment developed in the retail e-commerce marketplace come into play when businesses sell to other businesses. Online websites, display advertising, search engine advertising, e-mail, and social media are just as relevant in B2B e-commerce as they are in B2C e-commerce, and the technologies involved are the same. For example, as consumers have moved to mobile devices to purchase retail goods, so have business procurement and purchasing agents begun to move toward mobile purchasing, inventory management, and marketing.

Amazon Business is one kind of B2B e-commerce marketplace, where thousands of suppliers can interact with thousands of business buyers on an Internet-enabled platform. There are many kinds of B2B e-commerce marketplaces described later in the chapter, from simple websites where a single company markets to other businesses, to more complex marketplaces where suppliers, producers, and distributors work collaboratively in a digital environment to produce, manufacture, and distribute their products and services.

As you'll learn in Section 12.1, B2B e-commerce marketplaces such as Amazon Business have resulted from a decades-long evolution. In the early years of e-commerce, business firms tended to stick with direct purchases from manufacturers who were trusted, long-term trading partners rather than participate in public B2B markets. Sellers, in turn, were reluctant to participate for fear of extreme price competition and brand dilution. As a result, B2B e-commerce has evolved much more slowly than B2C e-commerce. Many of the early B2B e-commerce marketplaces that emerged in the late 1990s and early 2000s imploded within a few years. But today, following years of consolidation, some very large B2B e-commerce marketplaces are flourishing. We discuss the reasons for these early failures and describe how the new B2B e-commerce marketplaces have learned how to succeed.

In this chapter, we examine some major B2B e-commerce themes: procurement, supply chain management, and collaborative commerce. Each of these business processes has changed greatly with the evolution of B2B e-commerce systems. In Section 12.1,

we provide an overview of B2B e-commerce. In Section 12.2, we look more closely at the procurement process and supply chains. In Section 12.3, we place B2B e-commerce in the context of trends in procurement, supply chain management, and collaborative commerce, and describe changes in B2B marketing environment due to e-commerce. The final two sections of this chapter describe the two fundamental types of B2B e-commerce: B2B e-commerce marketplaces and private B2B networks.

Table 12.1 summarizes the leading trends in B2B e-commerce in 2022–2023. Most important are the issues related to supply chain vulnerability and risk highlighted by the supply chain disruptions that occurred as a result of the Covid-19 pandemic, which is likely to lead to significant changes in the way in which supply chains are handled. Other important trends include pressure to examine the environmental impact of supply chains, along with a growing public concern with the accountability of supply chains. What many businesses have learned in the last decade is that supply chains can strengthen or weaken a company, depending on a number of factors related to supply chain efficiency such as community engagement, labor relations, environmental protection, and sustainability. Many believe that all of these related factors are important to a firm's long-term profitability. Nearly all of the companies included in the S&P 500 stock index now use B2B e-commerce systems. Thousands of smaller firms are also now able to employ B2B e-commerce systems as low-cost cloud computing and software-as-a-service (SaaS) versions have become widely available. Taking advantage of the mobile platform, more and more companies are using mobile devices to run their businesses from any location. There are thousands of mobile apps available from enterprise B2B vendors such as SAP, IBM, Oracle, and others that link to supply chain management systems. Social network tools are pushing into the B2B world as well as the consumer world. B2B managers are increasingly using public and private social networks and technologies to enable long-term conversations with their customers and suppliers. Executives at firms large and small are coming to realize that they are competing not just with other firms but with those firms' supply chains as well. **Supply chain competition** refers to the fact that in some industries, firms are able to differentiate their product or pricing, and achieve a competitive advantage, due to superior supply chain management. Arguably, firms with superior supply chains can produce better products, more quickly, and at a lower cost than those with simply adequate supply chains.

supply chain competition differentiating a firm's products or prices on the basis of superior supply chain management

12.1 AN OVERVIEW OF B2B E-COMMERCE

The trade among business firms represents a huge marketplace. It is estimated that the total amount of B2B trade in all forms, both traditional and digital, in the United States in 2022 will be about $16 trillion, with B2B e-commerce contributing about $8.5 trillion of that amount (Insider Intelligence/eMarketer, 2022a; U.S. Census Bureau, 2021; authors' estimates). B2B e-commerce is expected to continue to grow, reaching about $10 trillion in the United States by 2026.

The process of conducting trade among business firms is complex and requires significant human intervention and, therefore, consumes significant resources. Some firms estimate that each corporate purchase order for support products costs them, on average, at least $100 in administrative overhead, which includes processing paper,

TABLE 12.1 MAJOR TRENDS IN B2B E-COMMERCE 2022–2023

BUSINESS
• The Covid-19 pandemic creates ongoing disruptions in supply chains and potentially long-range impacts on the way companies handle their supply chain. • B2B e-commerce growth continues to accelerate, with the Covid-19 pandemic acting as a catalyst for companies seeking to further digitize their B2B sales. • B2B e-distributors adopt the same marketing and sales techniques as successful consumer e-commerce companies such as Amazon. • Resurgence in B2B e-commerce marketplaces that bring together thousands of suppliers and buying firms • Risk management: companies heighten their focus on risks in supply chains after being caught off guard in recent years by a number of natural and man-made disasters. • Regional manufacturing: risks of far-flung global networks lead to an increase in regional manufacturing and supply chains, moving production closer to market demand. • Flexibility: growing emphasis on rapid-response and adaptive supply chains rather than lowest-cost supply chains, which typically carry great risks. • Supply chain visibility: growing use of real-time data that allows managers to see not only across their production but also into the production and financial condition of key suppliers. • Social and mobile commerce and customer intimacy: B2B buyers, like consumers, are tapping into mobile devices and social networks for purchasing, scheduling, exception handling, and coordinating with suppliers in order to manage supply chain risk.
TECHNOLOGY
• Big data: global trade and logistics systems are generating huge repositories of B2B data, swamping management understanding and controls. • Business analytics: growing emphasis on use of business analytics software (business intelligence) to understand very large data sets and predictive analytics tools to identify the most profitable customers. • Cloud: migration of B2B hardware and software to cloud computing and cloud apps, away from individual corporate data centers, as a means of slowing rising technology costs. B2B systems move to cloud computing providers like Amazon, Microsoft, Google, IBM, and Oracle as their core technology. • Mobile platform: growing use of mobile platform for B2B systems (CRM, SCM, and enterprise), putting B2B commerce into managers' palms. • Social networks: increasing use of social networks for feedback from customers, strengthening customer and supplier relationships, adjusting prices and orders, and enhancing decision-making. • Artificial intelligence (AI): Companies are increasingly turning to AI technologies and tools to deal with supply chain visibility, risk, and disruption. • Internet of Things (IoT): The number of IoT devices that measure and monitor data continues to grow exponentially and begins to impact how supply chains operate. • Blockchain: moves from a concept to practical applications for B2B e-commerce, with potential to transform supply chains and logistics.
SOCIETY
• Accountability: growing public demand for supply chain accountability and monitoring. • Sustainable supply chains: growing public demand for businesses to mitigate their environmental impact leads to reconsideration of the entire supply chain from design, production, customer service, to post-use disposal. • Supply chain disruptions drive home the critical role that supply chains play in business and everyday life.

approving purchase decisions, spending time to search for products and arrange for purchases, arranging for shipping, and receiving the goods. Across the economy, this adds up to trillions of dollars annually being spent for procurement processes. If even just a portion of inter-firm trade were automated, and parts of the entire procurement and sales process assisted by the Internet, then literally trillions of dollars might be released for more productive uses, consumer prices potentially would fall, productivity would increase, and the economic wealth of the nation would expand. This is the promise of B2B e-commerce. The challenge of B2B e-commerce is changing existing patterns and systems of procurement on the supply chain side and designing and implementing new marketing and distribution systems on the B2B sell side.

SOME BASIC DEFINITIONS

Before the Internet, business-to-business transactions were referred to simply as *inter-firm trade* or the *procurement process.* Today, we use the term **B2B commerce** to describe all types of inter-firm trade to exchange value across organizational boundaries, involving both the purchase of inputs and the distribution of products and services. B2B commerce includes the following business processes: customer relationship management, demand management, order fulfillment, manufacturing management, procurement, product development, returns, logistics/transportation, and inventory management. This definition of B2B commerce does not include transactions that occur within the boundaries of a single firm—for instance, the transfer of goods and value from one subsidiary to another, or the use of corporate intranets to manage the firm. We use the term **B2B e-commerce** (or **B2B digital commerce**) to describe specifically that portion of B2B commerce that is enabled by the Internet (including mobile apps). The links that connect business firms in the production of goods and services are referred to as the **supply chain**. Supply chains are a complex system of organizations, people, business processes, technology, and information, all of which need to work together to produce products efficiently. Today's supply chains are often global. For example, the Apple iPhone has hundreds of different parts, which Apple purchases from various suppliers in 43 different countries around the world. It then sends the parts to factories in China, India, South Korea, the Philippines, or the Czech Republic to be assembled, and then ships the finished iPhones to warehouses and retailers around the world (Brennan, 2021; Ross, 2020).

B2B commerce
all types of inter-firm trade

B2B e-commerce (B2B digital commerce)
that portion of B2B commerce that is enabled by the Internet and mobile apps

supply chain
the links that connect business firms with one another to coordinate production

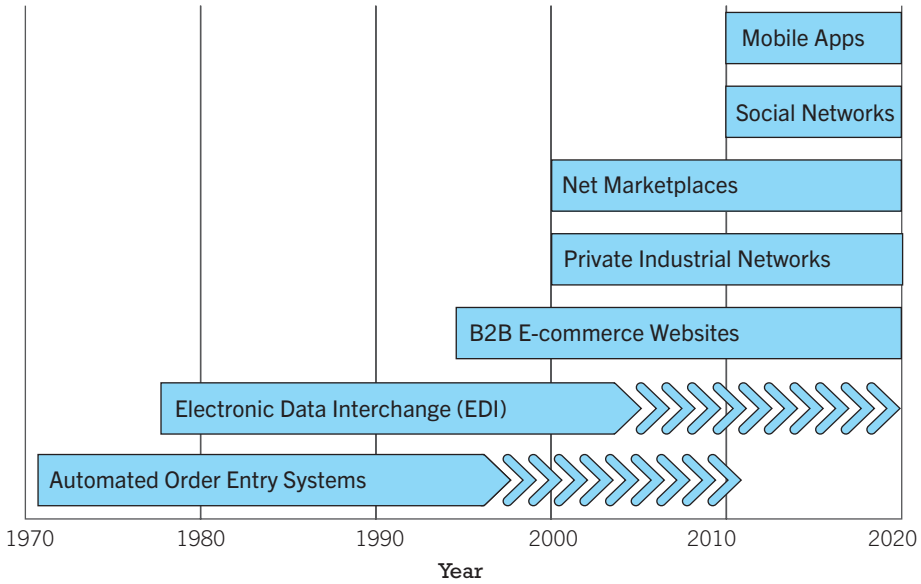
THE EVOLUTION OF B2B E-COMMERCE

B2B e-commerce has evolved over a 50-year period through several technology-driven stages (see **Figure 12.1**). (View the Figure 12.1 video in the eText for an animated and more detailed discussion of this figure.) The first step in the development of B2B e-commerce in the mid-1970s was **automated order entry systems** that involved the use of telephone modems to send digital orders to health care products companies such as Baxter Healthcare. This early technology was replaced by desktop computers using private communications networks in the late 1980s, and by Internet-connected desktop computers accessing online catalogs in the late 1990s. Automated order entry systems are **seller-side solutions**. They are owned by the suppliers and are seller-biased markets—they show goods from only a single seller. Customers benefited from these systems because they reduced the costs of

automated order entry systems
an automated order entry systems involve the use of telephone modems to send digital orders

seller-side solutions
seller-biased markets that are owned by, and show goods from only, a single seller

FIGURE 12.1 THE EVOLUTION OF THE USE OF TECHNOLOGY PLATFORMS IN B2B E-COMMERCE



B2B e-commerce has gone through many stages of development since the 1970s. Each stage reflects a major change in technology platforms from mainframes to private dedicated networks, and finally to the Internet, mobile apps, and social networks.

inventory replenishment and were paid for largely by the suppliers. Automated order entry systems continue to play an important role in B2B commerce.

By the late 1970s, a new form of computer-to-computer communication called electronic data interchange (EDI) emerged. **Electronic data interchange (EDI)** is a broadly defined communications protocol that enables firms to more easily share business documents such as invoices, purchase orders, shipping bills, product stocking numbers (SKUs), and settlement information. EDI is based on technical standards developed by the American National Standards Institute (ANSI X12 standards) and international bodies such as the United Nations (EDIFACT standards). Virtually all large firms have EDI systems, and most industry groups have industry standards for defining documents in that industry. EDI systems are owned by the buyers; hence they are **buyer-side solutions** and buyer-biased because they aim to reduce the procurement costs of supplies for the buyer. Of course, by automating the transaction, EDI systems also benefit the sellers through customer cost reduction. EDI systems generally serve vertical markets. A **vertical market** is one that provides expertise and products for a specific industry, such as automobiles. In contrast, **horizontal markets** serve many different industries. EDI continues to play an important role today as a general enabling technology that provides for the exchange of critical business information among computer applications supporting a wide variety of business processes. EDI is an important private B2B network technology, suited to supporting communications among a small set of strategic partners in direct, long-term trading relationships.

electronic data interchange (EDI)
a communications standard for sharing business documents and settlement information

buyer-side solutions
buyer-biased markets that are owned by buyers and that aim to reduce the procurement costs of supplies for buyers

vertical market
a market that provides expertise and products for a specific industry

horizontal market
a market that serves many different industries

B2B e-commerce websites emerged in the mid-1990s along with the commercialization of the Internet. **B2B e-commerce websites** are perhaps the simplest and easiest form of B2B e-commerce to understand because they are just online catalogs of products made available to the public marketplace by a single supplier. In this sense, they mimic the functionality of B2C e-commerce websites. Owned by the supplier, they are seller-side solutions and seller-biased because they show only the products offered by a single supplier.

B2B e-commerce website
an online catalog of products made available to the public marketplace by a single supplier

B2B e-commerce websites are a natural descendant of automated order entry systems, but there are two important differences: (1) the far less expensive and more universal Internet becomes the communication media and displaces private networks, and (2) B2B e-commerce websites tend to serve horizontal markets—they carry products that serve a wide variety of industries. Although B2B e-commerce websites emerged prior to B2B e-commerce marketplaces (described next), they are usually considered a type of B2B e-commerce marketplace. Today, more and more B2B manufacturers, distributors, and suppliers are using B2B e-commerce websites to sell directly to business customers, who most often are procurement/purchasing agents, as discussed in Section 12.2.

What were originally referred to as Net marketplaces emerged in the late 1990s as a natural extension and scaling-up of B2B e-commerce websites. Now commonly referred to as **B2B e-commerce marketplaces**, their essential characteristic is that they bring hundreds or even thousands of suppliers into a single Internet-based environment to conduct trade with business customers. There are many different kinds of B2B e-commerce marketplaces, which we describe in detail in Section 12.4.

B2B e-commerce marketplaces (Net marketplaces)
bring hundreds to thousands of suppliers and buyers into a sell-side, Internet-based environment to conduct trade

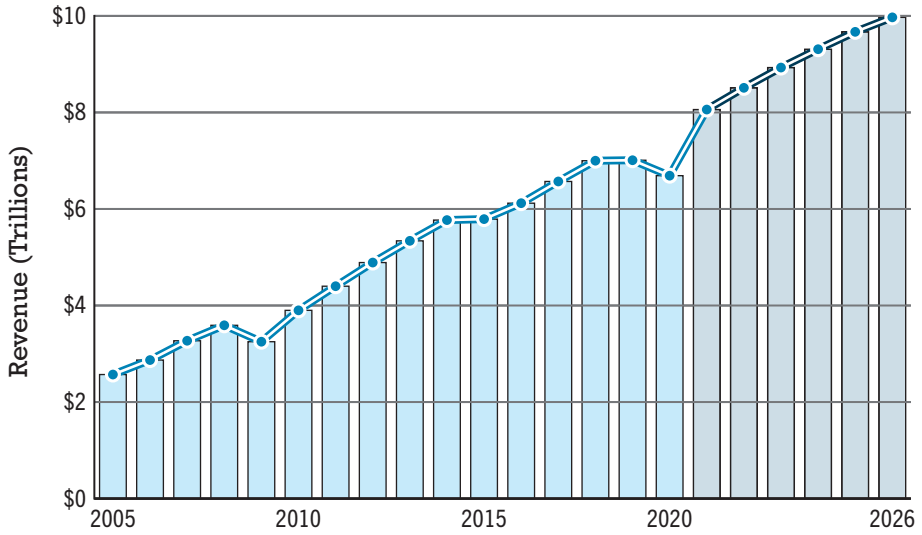
What were originally referred to as private industrial networks, but are now more commonly referred to as just private B2B networks, also emerged in the last decade as natural extensions of EDI systems and the existing close relationships that developed between large firms and their trusted suppliers. **Private B2B networks** are Internet-based communication environments that extend far beyond procurement to encompass supply chain efficiency enhancements and truly collaborative commerce where the buyers work with the sellers to develop and design new products. Private B2B networks are described in more detail in Section 12.5.

private B2B networks (private industrial networks)
Internet-based communication environments that extend far beyond procurement to encompass truly collaborative commerce

THE GROWTH OF B2B E-COMMERCE

Figure 12.2 illustrates the growth of B2B e-commerce from 2005 to 2026. From 2005 to 2021, B2B e-commerce grew from $2.6 trillion (accounting for 25% of total B2B commerce in the United States) to an estimated $8.1 trillion (almost 52% of all B2B commerce). B2B e-commerce will continue to grow, and by 2026 is expected to reach about $10 trillion (about 55% of all B2B commerce). **Figure 12.3** illustrates the share that each of the types of B2B commerce (traditional B2B, B2B e-commerce marketplaces, EDI, and private B2B networks) had of total B2B commerce in 2021. Several observations are important to note with respect to Figure 12.3. First, it shows that the initial belief that B2B e-commerce marketplaces would become the dominant form of B2B e-commerce is not supported even though their growth rate has increased as firms like Amazon, Alibaba, and eBay establish such marketplaces. Second, it shows that EDI and private B2B networks play a more important role than widely assumed in B2B e-commerce. EDI remains quite common and continues to be a workhorse of B2B commerce even though its growth is expected to be relatively flat over the next few years.

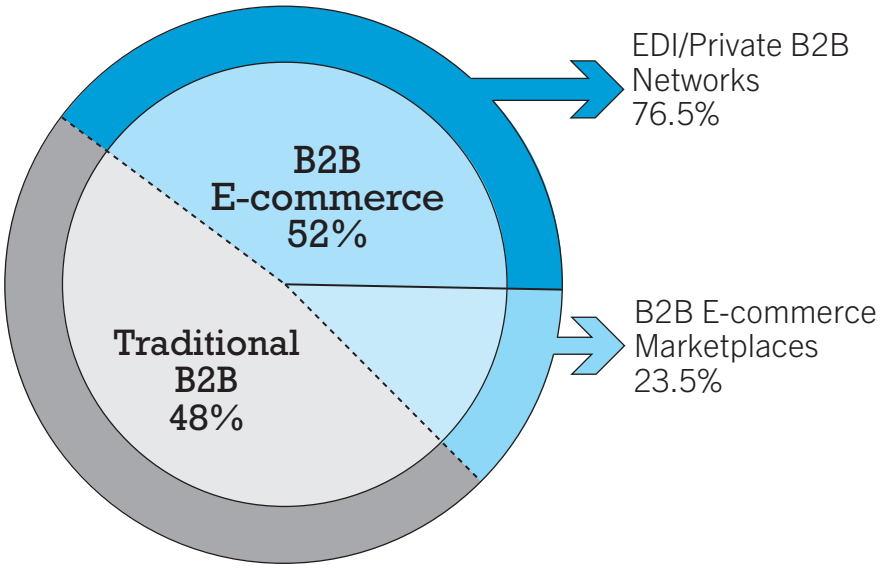
FIGURE 12.2 THE GROWTH OF B2B E-COMMERCE IN THE UNITED STATES



B2B e-commerce in the United States is almost seven times the size of B2C e-commerce. In 2026, B2B e-commerce is projected to be reach around $10 trillion.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022a; U.S. Census Bureau, 2021; authors' estimates.

FIGURE 12.3 B2B COMMERCE 2021



In 2021, B2B e-commerce accounted for more than half (52%) of all B2B commerce. Within B2B e-commerce, EDI/private B2B networks accounted for the vast majority of B2B e-commerce (more than 75%). Contrary to initial expectations, various types of B2B e-commerce marketplaces accounted for only about 24%.

SOURCES: Based on data from Insider Intelligence/eMarketer, 2022a; Digital Commerce 360, 2022; U.S. Census Bureau, 2021; authors' estimates.

POTENTIAL BENEFITS AND CHALLENGES OF B2B E-COMMERCE

Regardless of the specific type, B2B commerce as a whole promises many strategic benefits to firms—both buyers and sellers—and impressive gains for the economy. B2B e-commerce can:

- Lower administrative costs
- Lower search costs for buyers
- Reduce inventory costs by increasing competition among suppliers (increasing price transparency) and reducing inventory to the bare minimum
- Lower transaction costs by eliminating paperwork and automating parts of the procurement process
- Increase production flexibility by ensuring delivery of parts at just the right time (known as just-in-time production)
- Improve quality of products by increasing cooperation among buyers and sellers and reducing quality issues
- Decrease product cycle time by sharing designs and production schedules with suppliers
- Increase opportunities for collaborating with suppliers and distributors
- Create greater price transparency—the ability to see the actual buy and sell prices in a market
- Increase the visibility and real-time information sharing among all participants in the supply chain network

While there are many potential benefits to B2B e-commerce, there are also considerable risks and challenges. Often real-world supply chains fail to provide visibility into the supply chain because they lack real-time demand, production, and logistics data, and have inadequate financial data on suppliers. The result is unexpected supplier failure and disruption to the supply chain. Builders of B2B supply chains have often had little concern for the environmental impacts of supply chains, the sensitivity of supply chains to natural events, fluctuating fuel and labor costs, or the impact of public values involving labor and environmental policies. The result is that many Fortune 1000 supply chains are risky, vulnerable, and socially and environmentally unsustainable.

Read *Insight on Society: Supply Chains Hit the Headlines* for a look at the impact of "black swan" (unpredictable and unanticipated) events on global supply chains.

12.2 THE PROCUREMENT PROCESS AND SUPPLY CHAINS

The subject of B2B e-commerce can be complex because there are so many ways the Internet can be used to support the exchange of goods and payments among organizations, efficient supply chains, and collaboration. At the most basic level, B2B e-commerce is about changing the **procurement process** (how firms purchase the goods they need to produce the goods they will ultimately sell to consumers) of thousands of firms across the United States and the world. In the procurement process, firms purchase goods from a set of suppliers, which in turn purchase their inputs from their own set of suppliers. The supply chain includes not just the firms themselves but also the relationships among them and the processes that connect them.

procurement process how firms purchase the goods they need to produce goods for consumers

INSIGHT ON SOCIETY

SUPPLY CHAINS HIT THE HEADLINES

Prior to the Covid-19 pandemic, the general public did not pay much attention to supply chains. Although various events over the years, such as the 2011 earthquake and tsunami in Japan, the financial crisis of 2007–2009, and geopolitical tensions such as England's exit from the European Union, created some supply chain disruptions, they were in general relatively limited in time and impact.

But then in early 2020, the pandemic occurred. It was the first domino in a long line of events that continues to impact supply chains today and has resulted in supply chains becoming the topic of both headlines and popular conversation. In response to the initial outbreak, China greatly reduced its economic output, including closing manufacturing plants across the country. Companies around the world were heavily impacted by this reduction. Hyundai announced suspension of production at seven of its plants in Korea because it could not acquire essential parts. Apple was forced to close stores all around the world because so much of its supply chain was located within China and Malaysia, which also had mass closings of manufacturing facilities. Many companies that had relied almost entirely on China for large portions of their supply chain saw their operations grind to a halt.

The impact of the first wave of the pandemic on supply chains was a wake-up call for many businesses. Many manufacturers had yet to modernize their supply chains to the point where they could quickly determine how much demand there was for their products, how much supply they had, and the precise location of their products and parts. Covid-19 exposed those shortcomings. Even Walmart, which is often considered the holy grail of supply chain management, struggled to predict how much inventory to keep on its shelves. Like many companies, Walmart models future consumer behavior using past behavior as its inputs. The pandemic environment was so unusual that this type of method lost its accuracy. Manufacturers and shipping companies assumed that demand for goods of all kinds would drop drastically due to the pandemic.

But what happened was that instead, demand shifted, in many cases to consumer goods produced in China. Once China's factories were up and running again, the surge of demand first swamped the availability of shipping containers, delaying transport, and then, as the goods began to be shipped, overwhelmed U.S. ports. Even once the ships were able to dock and unload their containers, a shortage of truck drivers created another bottleneck. Shortages of warehouse space and warehouses added a further kink to the supply chain, further slowing delivery of goods to the ultimate consumers.

In March 2022, while companies were still trying to cope with continuing supply chain issues created by the pandemic, including a new Covid surge in China that was once again closing factories, yet another major jolt occurred. Russia's invasion of Ukraine set off a series of new supply chain worries, cutting off exports from Ukraine and putting some Russian businesses under sanction. For instance, Ukraine is the world's leading source of neon, a gas needed for lasers in the

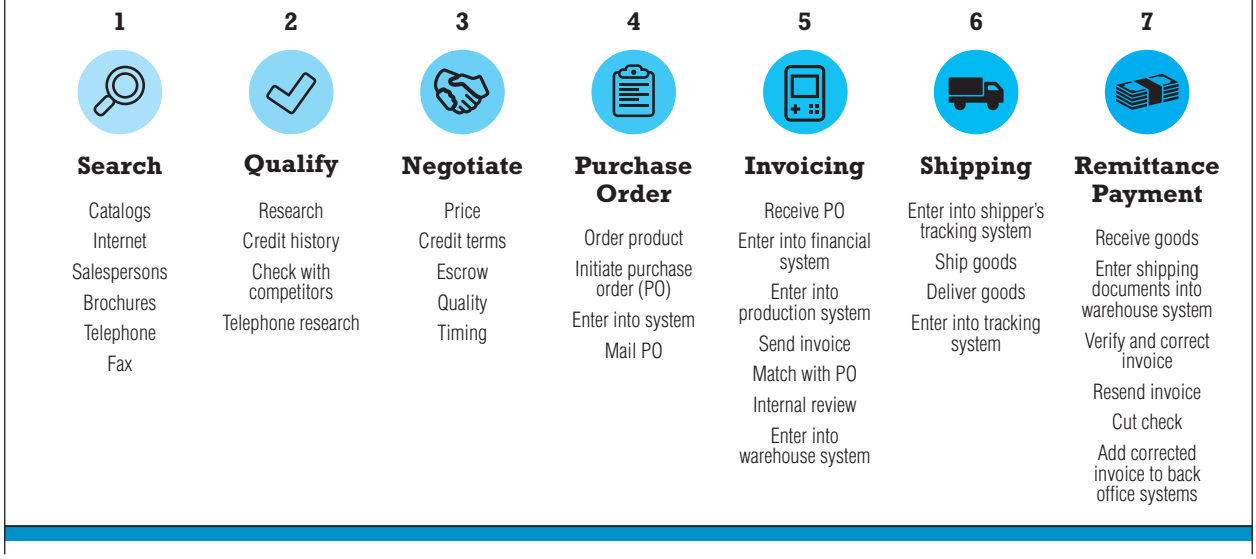
semiconductor chip-making process. Russia's MMC Norilsk Nickel is a major producer of nickel, which goes into electric vehicle batteries, and also produces 40% of the world's palladium, which is used in catalytic converters and semiconductors. The invasion is also disrupting shipping operations around the world, with many countries barring Russian ships from their ports.

What, if anything, can companies do to alleviate the supply chain crisis? Although the pandemic and Russian invasion of Ukraine may have been "black swan" events that no one expected, the roots of the supply crisis actually stem in part from structural weaknesses, such as the "just-in-time" and lean production models, in which companies hold as few raw materials, parts, and products in inventory as possible, instead buying what they need only as they need it. However, this model works only when those items are readily available as needed. After decades of reliance on this model, manufacturers may need to revert to a more prudent focus on extra capacity. Likewise, for decades, inexpensive and reliable shipping, coupled with cooperative trade agreements, enabled far-flung production. If this is no longer a given, companies that have relied on global production may be forced to rethink that strategy and move production closer to customers.

While addressing these systemic issues will not be easy and will likely take time, in the meantime, companies are placing a priority on digital technology and strategy in an effort to cope with their disrupted supply chains. They are investing in artificial intelligence tools that can help gather and analyze data in real time to make quicker adjustments to changes in production and demand. They are also investing in Internet of Things (IoT) solutions, which allow them to more accurately track the location of their products across the supply chain. Many manufacturers are investigating blockchain-based inventory tracking solutions that offer a centralized and secure way for every link in a supply chain to achieve better visibility into the status of inventory, even end consumers. Businesses are looking to 3-D printing services, which allow much greater flexibility to create many different parts and components. For instance, oil and gas company Shell has a digital warehouse containing 3-D designs of spare parts for its production machinery. Smaller businesses are beginning to rely on third-party warehousing services like Flexe that specialize in locating and preparing stocked items for shipping. Companies hope that these sorts of investments will help them spot and react to supply chain issues more quickly and enable them to prosper even if supply chain disruptions continue for some time to come.

SOURCES: "Placing a Priority on Digital Technology and Strategy," by Paul Demery, Digitalcommerce360.com, April 5, 2022; "Why the Global Supply Chain Mess Is Getting So Much Worse," by Chris Isodore, Cnn.com, March 30, 2022; "Are the Risks of Global Supply Chains Starting to Outweigh the Rewards?," by Willy Shih, *Harvard Business Review*, March 21, 2022; "This Russian Metals Giant Might Be Too Big to Sanction," by Alistair McDonald, *Wall Street Journal*, March 7, 2022; "War in Ukraine Disrupts Ships around the Globe," by Costas Paris and Benoit Faucon, *Wall Street Journal*, March 1, 2022; "The Technology that's Helping Companies Thrive Amid Supply Chain Chaos," by Christopher Mims, *Wall Street Journal*, February 12, 2022; "Breaking out the Survival Kit to Cope with Supply Chain Disruption," by Robert Bowman, Supplychainbrain.com, February 10, 2022; "A Normal Supply Chain? It's 'Unlikely' in 2022," by Peter Goodman, *New York Times*, February 1, 2022; "Can Digital Technology Prevent Supply Chain Disruptions?," by Pete Swabey, Techmonitor.ai, October 6, 2021; "Supply Chain Data Visibility Paramount as Industry Lurches into Next Chapter," by Lauren Horwitz, Iotworldtoday.com, May 21, 2020; "The Algorithms Big Companies Use to Manage Their Supply Chains Don't Work during Pandemics," by Nicole Wetsman, Theverge.com, April 27, 2020; "How Supply Chains Jumped from Business School and into Our Lives," Supplychainbrain.com, March 31, 2020; "The Coronavirus Is Shattering Traditional Supply Chains," by Sundar Kamakshisundaram, Supplychainbrain.com, March 25, 2020; "The Coronavirus Has Upended Supply Chains. Here's How Companies Can Prepare for the Next Disruption," by Fred Schmalz, Insight.kellogg.northwestern.edu, March 23, 2020.

FIGURE 12.4 THE PROCUREMENT PROCESS



The procurement process is a lengthy and complicated series of steps that involves the seller, buyer, and shipping companies in a series of connected transactions.

STEPS IN THE PROCUREMENT PROCESS

There are seven separate steps in the procurement process (see **Figure 12.4**). The first three steps involve deciding who to buy from and what to pay: searching for suppliers of specific products; qualifying both sellers and the products they sell; and negotiating prices, credit terms, escrow requirements, quality, and scheduling of delivery. Once a supplier is identified, purchase orders are issued, the buyer is sent an invoice, the goods are shipped, and the buyer sends a payment. Each of these steps in the procurement process is composed of many separate business processes and subactivities. Each of these activities must be recorded in the information systems of the seller, buyer, and shipper. Often, this data entry is not automatic and involves a great deal of manual labor, telephone calls, faxes, and e-mails.

direct goods
goods directly involved in the production process

indirect goods
all other goods not directly involved in the production process

MRO goods
products for maintenance, repair, and operations

contract purchasing
involves long-term written agreements to purchase specified products, under agreed-upon terms and quality, for an extended period of time

TYPES OF PROCUREMENT

Two distinctions are important for understanding how B2B e-commerce can improve the procurement process. First, firms make purchases of two kinds of goods from suppliers: direct goods and indirect goods. **Direct goods** are goods integrally involved in the production process—for instance, when an automobile manufacturer purchases sheet steel for auto body production. **Indirect goods** are all other goods not directly involved in the production process, such as office supplies and maintenance products. Often these goods are called **MRO goods**—products for maintenance, repair, and operations.

Second, firms use two different methods for purchasing goods: contract purchasing and spot purchasing. **Contract purchasing** involves long-term written agreements to purchase specified products, with agreed-upon terms and quality, for an extended

period of time. Generally, firms purchase direct goods using long-term contracts. **Spot purchasing** involves the purchase of goods based on immediate needs in larger marketplaces that involve many suppliers. Generally, firms use spot purchasing for indirect goods, although in some cases, firms also use spot purchasing for direct goods. According to some estimates, spot purchases account for up to 40% of total procurement spending (Rajala, 2021).

spot purchasing involves the purchase of goods based on immediate needs in larger marketplaces that involve many suppliers

Although the procurement process involves the purchasing of goods, it is extraordinarily information-intense, involving the movement of information among many existing corporate systems. The procurement process today is also very labor-intensive, directly involving 500,000 employees in the United States, not including those engaged in transportation, finance, insurance, or general office administration related to the process. The key players in the procurement process are the purchasing managers. They ultimately decide whom to buy from, what to buy, and on what terms. Purchasing managers (also called "procurement managers") are also the key decision-makers for the adoption of B2B e-commerce solutions. As purchasing managers have become more familiar and comfortable with B2C e-commerce in their personal lives, they are increasingly coming to expect the same type of purchasing experience in the B2B arena (Harouni, 2022). As a result, B2B manufacturers, suppliers, and distributors are finding that in order to effectively compete, they must pay more attention to the online customer experience, just as their B2C counterparts do. Features that B2B customers now expect include enhanced search functionality, up-to-date product pricing and availability information, product configurators, mobile support, apps along with websites, online support forums, live customer service reps, and a database that contains their corporate purchasing history, shipping preferences, and payment data and that provides support for repeat orders.

MULTI-TIER SUPPLY CHAINS

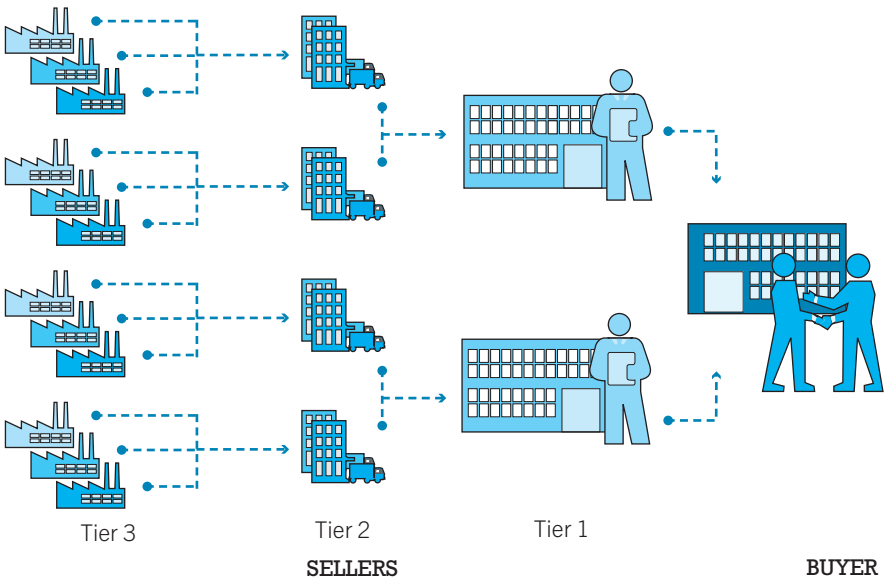
Although Figure 12.4 captures some of the complexity of the procurement process, it is important to realize that firms purchase thousands of goods from thousands of suppliers. The suppliers, in turn, must purchase their inputs from their suppliers. Large manufacturers such as Ford Motor Company have more than 20,000 suppliers of parts, packaging, and technology. The number of secondary and tertiary suppliers is at least as large. Together, this extended **multi-tier supply chain** (the chain of primary, secondary, and tertiary suppliers) constitutes a crucial aspect of the industrial infrastructure of the economy. **Figure 12.5** depicts a firm's multi-tier supply chain.

multi-tier supply chain the chain of primary, secondary, and tertiary suppliers

The supply chain depicted in Figure 12.5 is a three-tier chain simplified for the sake of illustration. In fact, large Fortune 1000 firms have thousands of suppliers, who in turn have thousands of smaller suppliers. The real-world supply chain is often many layers deep. The complexity of the supply chain suggests a combinatorial explosion. Assuming a manufacturer has four primary suppliers and each one has three primary suppliers, and each of these has three primary suppliers, then the total number of suppliers in the chain (including the buying firm) rises to 53. This figure does not include the shippers, insurers, and financiers involved in the transactions.

Immediately, you can see from Figure 12.5 that the procurement process involves a very large number of suppliers, each of whom must be coordinated with the production needs of the ultimate purchaser—the buying firm. You can also understand how difficult it is to manage the supply chain or to obtain visibility into the supply chain, simply because of its size and scope.

FIGURE 12.5 THE MULTI-TIER SUPPLY CHAIN



The supply chain for every firm is composed of multiple tiers of suppliers.

VISIBILITY AND OTHER CONCEPTS IN SUPPLY CHAIN MANAGEMENT

supply chain visibility the extent to which purchasing firms can monitor second- and third-tier suppliers' activities

The global, multi-tier nature of supply chains produces a number of challenges for supply chain managers. A central concept of supply chains is **supply chain visibility**, which refers to the ability of a firm to monitor the output and pricing of its first- and second-tier suppliers, track and manage supplier orders, and manage transportation and logistics providers who are moving the products. A supply chain is visible when you know exactly what you have ordered from your suppliers and what their production schedule is, and when you can track the goods through shipping and trucking firms to your in-bound warehouse. With this knowledge, the firm's internal enterprise systems can produce production schedules and develop financial forecasts. Generally, the more firms invest in digitally enabled supply chains, the greater the visibility into the process that managers have. Supply chain visibility has become even more of a priority in the wake of the Covid-19 pandemic, as many firms continue to suffer severe supply chain disruptions, in part due to lack of real-time data about the functioning of their supply chains. The pandemic has highlighted the fact that supply chain practices such as just-in-time and lean manufacturing (discussed further in the next section) present heightened risk unless coupled with full supply chain visibility into demand, supply, and logistics (Horwitz, 2020).

Other key concepts in supply chain management, and which are also central management challenges, are described in **Table 12.2**.

TABLE 12.2 CONCEPTS AND CHALLENGES IN SUPPLY CHAIN MANAGEMENT

CONCEPT/CHALLENGE	DESCRIPTION
Visibility	Having the ability to monitor suppliers, orders, logistics, and pricing
Demand forecasting	Informing your suppliers of future demand
Production scheduling	Informing your suppliers of the production schedule
Order management	Keeping track of orders to your suppliers
Logistics management	Managing your logistics partners based on your production schedule

THE ROLE OF EXISTING LEGACY COMPUTER SYSTEMS AND ENTERPRISE SYSTEMS IN SUPPLY CHAINS

Complicating efforts to coordinate the many firms in a supply chain is the fact that each firm often has its own set of legacy computer systems, sometimes homegrown or customized, that cannot easily pass information to other systems. **Legacy computer systems** generally are older enterprise systems used to manage key business processes within a firm in a variety of functional areas from manufacturing, logistics, finance, and human resources. **Enterprise systems** are corporate-wide systems that relate to all aspects of production, including finance, human resources, and procurement. Many large global firms have implemented global enterprise-wide systems from major vendors such as IBM, SAP, Oracle, and others. Generally, enterprise systems have an inward focus on the firm's internal production processes, and only tangentially are concerned with suppliers. More contemporary cloud-based, dedicated B2B software that can be integrated with existing enterprise systems is growing in importance. Companies such as IBM, Oracle, SAP, and many smaller firms have developed SaaS (software as a service) or on-demand cloud-based supply chain management systems that can work seamlessly with their legacy offerings. Although many firms still prefer to maintain their own supply chain management systems in their private clouds rather than use shared public cloud services, cloud-based supply chain management software revenues are expected to grow at a cumulative average growth rate of 16% between 2022 and 2027, more than doubling from $6 billion in 2021 to $14.5 billion by 2027 (Research and Markets, 2022).

legacy computer systems
older enterprise systems used to manage key business processes within a firm in a variety of functional areas

enterprise systems
corporate-wide systems that relate to all aspects of production, including finance, human resources, and procurement

12.3 TRENDS IN SUPPLY CHAIN MANAGEMENT AND COLLABORATIVE COMMERCE

It is impossible to comprehend the actual and potential contribution of B2B e-commerce, or the successes and failures of B2B e-commerce vendors and markets, without understanding ongoing efforts to improve the procurement process through a variety of supply chain management programs that long preceded the development of e-commerce.

supply chain management (SCM) refers to a wide variety of activities that firms and industries use to coordinate the key players in their procurement process

Supply chain management (SCM) refers to a wide variety of activities that firms and industries use to coordinate the key players in their procurement process. For the most part, today's procurement managers still work with telephones, e-mail, fax machines, face-to-face conversations, and instinct, relying on trusted, long-term suppliers for their strategic purchases of goods directly involved in the production process.

There have been a number of major developments in supply chain management over the last two decades that set the ground rules for understanding how B2B e-commerce works (or fails to work). These developments include supply chain simplification, just-in-time and lean production, adaptive supply chains, sustainable supply chains, mobile B2B, cloud-based B2B, supply chain management systems, the use of blockchain in supply chains, and collaborative commerce.

SUPPLY CHAIN SIMPLIFICATION AND JUST-IN-TIME AND LEAN PRODUCTION

supply chain simplification involves reducing the size of the supply chain and working more closely with a smaller group of strategic supplier firms to reduce both product costs and administrative costs, while improving quality

tight coupling a method for ensuring that suppliers precisely deliver the ordered parts, at a specific time and particular location, to ensure the production process is not interrupted for lack of parts

just-in-time production a method of inventory cost management that seeks to reduce excess inventory to a bare minimum

lean production a set of production methods and tools that focuses on the elimination of waste throughout the customer value chain

Many manufacturing firms have spent the past two decades reducing the size of their supply chains and working more closely with a smaller group of strategic supplier firms to reduce both product costs and administrative costs, while improving quality, a trend known as **supply chain simplification**. Following the lead of Japanese industry, for instance, the automobile industry has systematically reduced the number of its suppliers by more than 50%. Instead of open bidding for orders, large manufacturers have chosen to work with strategic partner supply firms under long-term contracts that guarantee the supplier business and also establish quality, cost, and timing goals. These strategic partnership programs are essential for just-in-time production models, and often involve joint product development and design, integration of computer systems, and tight coupling of the production processes of two or more companies. **Tight coupling** is a method for ensuring that suppliers precisely deliver the ordered parts at a specific time and to a particular location, ensuring the production process is not interrupted for lack of parts.

Just-in-time production is a method of inventory cost management that seeks to reduce excess inventory to a bare minimum. In just-in-time production, the parts needed for, say, an automobile, arrive at the assembly factory a few hours or even minutes before they are attached to a car. Payment for the parts does not occur until the parts are attached to a vehicle on the production line. In the past, producers used to order enough parts for a week's or even a month's worth of production, creating huge, costly buffers in the production process. These buffers ensured that parts would almost always be available, but at a large cost. **Lean production** is a set of production methods and tools that focuses on the elimination of waste throughout the customer value chain. It is an extension of just-in-time production beyond inventory management to the full range of activities that create customer value. Originally, just-in-time and lean methods were implemented with phones, faxes, and paper documents to coordinate the flow of parts in inventory. Supply chain management systems now have largely automated the process of acquiring inventory from suppliers and made possible significant savings on a global basis. Arguably, contemporary supply chain systems are the foundation of today's global B2B production system.

However, as noted previously and as discussed in the *Insight on Society* case, the Covid-19 pandemic has shown that just-in-time and lean production and supply chain simplification all present significant risk. For instance, in the food supply industry, over the past 20 years, companies have gone from keeping several months' worth of inventory on hand in warehouses to typically keeping only a four-to-six-week supply. When the pandemic hit, algorithmic models failed to predict the radical shift in consumer behavior, catching many companies short on inventory and unable to fulfill demand. Similar situations abounded in other critical industries, such as health care, with commentators calling for such industries to build more "slack" into their systems, including "just-in-case" inventory. Although supply chain simplification reduces costs and improves quality, going forward, businesses will need to develop a network of alternative suppliers in multiple locations rather than rely on sourcing key products from a single supplier, region, or country (Gasparro, Smith, and Kang, 2020; Shih, 2020).

SUPPLY CHAIN BLACK SWANS: ADAPTIVE SUPPLY CHAINS

While firms have greatly simplified their supply chains in the last decade, they have also sought to centralize them by adopting a single, global supply chain system that integrates all the firm's vendor and logistics information into a single enterprise-wide system. Large software firms such as Oracle, IBM, and SAP encourage firms to adopt a "one world, one firm, one database" enterprise-wide view of the world in order to achieve scale economies and simplicity, and to optimize global cost and value.

Beginning in earnest in 2000, managers in developed countries used these new technological capabilities to push manufacturing and production to the lowest-cost labor regions of the world. By 2005, many economists believed a new world economic order had emerged based on inexpensive labor capable of producing inexpensive products for Western consumers, profits for global firms, and the opening of Asian markets to Western goods and financial products.

As it turns out, there were many risks and costs to this strategy of concentrating production in a world of economic, financial, political, and even geological instability. Firms now realize that they need to be careful in balancing gains in efficiency from a highly centralized supply chain with the risks inherent to such a strategy. For instance, the 2011 earthquake and tsunami in Japan had a significant impact on supply chains around the world. In the global financial crisis of 2007–2009, relying on suppliers in parts of Europe where currencies and interest rates fluctuated greatly exposed many firms to higher costs than anticipated. Throughout 2018 and 2019, the imposition of tariffs by the Trump administration on the importation of various goods and the specter of a "trade war" raised supply chain disruption fears. In recent years, technology has become a significant source of supply chain disruptions, with major disruptions due to failure of cloud-based services and cyberattacks. And of course, as previously discussed, the Covid-19 pandemic has been perhaps the ultimate "black swan" event, resulting in significant, continuing supply chain disruptions (Allianz, 2022).

The risks and costs of extended and concentrated supply chains have begun to change corporate strategies (Chopra and Sodhi, 2014). To cope with unpredictable

adaptive supply chain allows companies to react to disruptions in the supply chain in a particular region by moving production to a different region

world events, firms are taking steps to create **adaptive supply chains** that allow them to react to disruptions in the supply chain in a particular region by moving production to a different region. Many companies are breaking up single global supply chain systems into regional or product-based supply chains and reducing the level of centralization. Using adaptive supply chains, firms can decide to locate some production in Latin America, for instance, rather than having all their production or suppliers in a single country such as Japan or China. They will thus be able to move production around the world to temporary, safe harbors. This may result in higher short-term costs, but provide substantial, longer-term risk protection in the event any single region is disrupted. Increasingly, supply chains are being built based on the assumption that global disruptions in supply are inevitable, but not predictable. The focus today is on optimal-cost, not low-cost, supply chains, and more distributed manufacturing along with more flexible supply chains that can shift reliably from high-risk to low-risk areas. Regional manufacturing means shorter supply chains that can respond rapidly to changing consumer tastes and demand levels (PriceWaterhouseCoopers and the MIT Forum for Supply Chain Innovation, 2015).

ACCOUNTABLE SUPPLY CHAINS: LABOR STANDARDS

accountable supply chain one where the labor conditions in low-wage, less developed producer countries are visible and morally acceptable to the ultimate consumers in more developed, industrial societies

Accountable supply chains are those where the labor conditions in low-wage, less developed producer countries are visible and morally acceptable to the ultimate consumers in more developed, industrial societies. For much of the last century, U.S. and European manufacturers with global supply chains sought to hide the realities of their offshore production factories. For global firms with long supply chains, visibility did not mean their consumers could understand how their products were made. However, in part because of the growing power of the Internet to empower citizen reporters around the world, the realities of global supply chains have slowly become more transparent to the public.

A number of groups in the last decade have contributed to efforts to make global supply chains more transparent and to develop minimal standards of accountability. Among these groups are the National Consumers League, Human Rights First, the Maquila Solidarity Network, the Global Fairness Initiative, the Clean Clothes Campaign, the International Labor Organization (UN), and the Fair Labor Association (FLA). The FLA is a coalition of business firms with offshore production and global supply chains, universities, and private organizations. For member firms, the FLA conducts interviews with workers, makes unannounced visits to factories to track progress, and investigates complaints. They are also one of the major international labor standard-setting organizations (Fair Labor Association, 2022).

SUSTAINABLE SUPPLY CHAINS

Sustainable business is a call for business to take social and ecological interests, and not just corporate profits, into account in all their decision-making throughout the firm (UN Global Compact, 2018). Since the United Nations World Commission on Environment and Development (WCED) published the first comprehensive report on sustainable business in 1987, firms around the globe have struggled with these

concepts and in some cases ignored, resisted, or simply viewed them as a threat to profitability. The WCED's report (*Our Common Future*) argued for a balance of profits, social community development, and minimal impact on the world environment, including, of course, the carbon footprint of business. Today, the consensus among major firms in Europe, Asia, and the United States has become that in the long term, and through careful planning, sustainable business and **sustainable supply chains** are good business because it means using the most efficient environment-regarding means of production, distribution, and logistics. These efficient methods create value for consumers, investors, and communities (Suering and Muller, 2008). The concept of a circular economy is also related to the same issues that are driving the creation of sustainable supply chains. A **circular economy** is based on three primary principles: the elimination of waste and pollution in the production process, the circulation (recycling) of products and materials, and the regeneration of nature (Ellen Macarthur Foundation, 2022; Banker, 2021).

sustainable supply chain involves using the most efficient environment-regarding means of production, distribution, and logistics

circular economy based on three primary principles: the elimination of waste and pollution in the production process, the circulation (recycling) of products and materials, and the regeneration of nature

Notions of sustainable business have had a powerful impact on supply chain thinking. In part, these efforts are good risk management. All advanced countries have substantially strengthened their environmental regulations. It makes good business sense for firms to prepare methods and operations suitable to this new environment.

For instance, all the major textiles brands and retailers have announced plans for a more sustainable supply chain in textiles. One of the world's truly ancient industries, textiles supports millions of workers while consuming extraordinary resources. It takes 1,000 gallons of water to make one pound of finished cotton (your jeans, for instance). While growing cotton has its issues (fertilizer), the subsequent dyeing, finishing, and cleaning of cotton make it the number one industrial polluter on Earth. It's not a small matter, then, that Walmart, Gap, Levi's, Nike, and other large players in the industry are taking steps to reduce the environmental impact of their operations by improving the efficiency of the entire supply and distribution chains.

Other firms and entire industries are also working to develop sustainable supply chains. For instance, McKesson, North America's largest distributor of drugs, used web-based supply chain software from IBM to minimize carbon dioxide emissions throughout its supply chain, while lowering its distribution costs. The software enabled McKesson to determine low-cost refrigeration alternatives for certain medicines (such as insulin and vaccines), identify the environmentally least harmful way to bring new products into its distribution network, and determine the best way to transport pharmaceuticals to customers. The Responsible Business Alliance, whose members include IBM, HP, Dell, Apple, and others, have developed standards, assessment tools, and training (Villena and Gioia, 2020).

MOBILE B2B

Just as with B2C commerce, mobile devices have become increasingly important in all aspects of B2B e-commerce, through all steps of the procurement process and throughout the supply chain. Many companies have adopted a **Bring Your Own Device (BYOD) policy**, in which employees use their personal smartphone, tablet, or laptop computer on the company's network, which has helped contribute to these devices' growing importance in B2B.

Bring Your Own Device (BYOD) policy employees use their personal smartphone, tablet, or laptop computer on the company's network

On the procurement front, B2B buyers are increasingly using mobile devices for all phases of the purchase process, from discovery to decision-making, to actual purchase. A majority of B2B buyers worldwide now believe their mobile device is essential to their work. B2B buyers want to be able to place orders using mobile devices just as they do in the B2C arena, and increasingly expect B2B e-commerce sites to be readily accessible from such devices, to be able to start an order from a device and finish it on their desktop and vice versa, and to be able to get online customer service on their mobile devices.

On the supply chain front, many supply chain network and software providers are enhancing their offerings by providing support for mobile devices and applications. For instance, Elementum provides a variety of mobile apps running on a cloud platform to track various aspects of the supply chain and enable supply chain visibility. For instance, Elementum enables companies to identify and respond to risks in their supply chain, providing real-time alerts on events that may impact the supply, manufacture, or distribution of components of their products. Elementum also helps companies monitor the health of their supply chain by providing a dashboard that provides real-time tracking of key performance indicators (KPIs) in the supply chain.

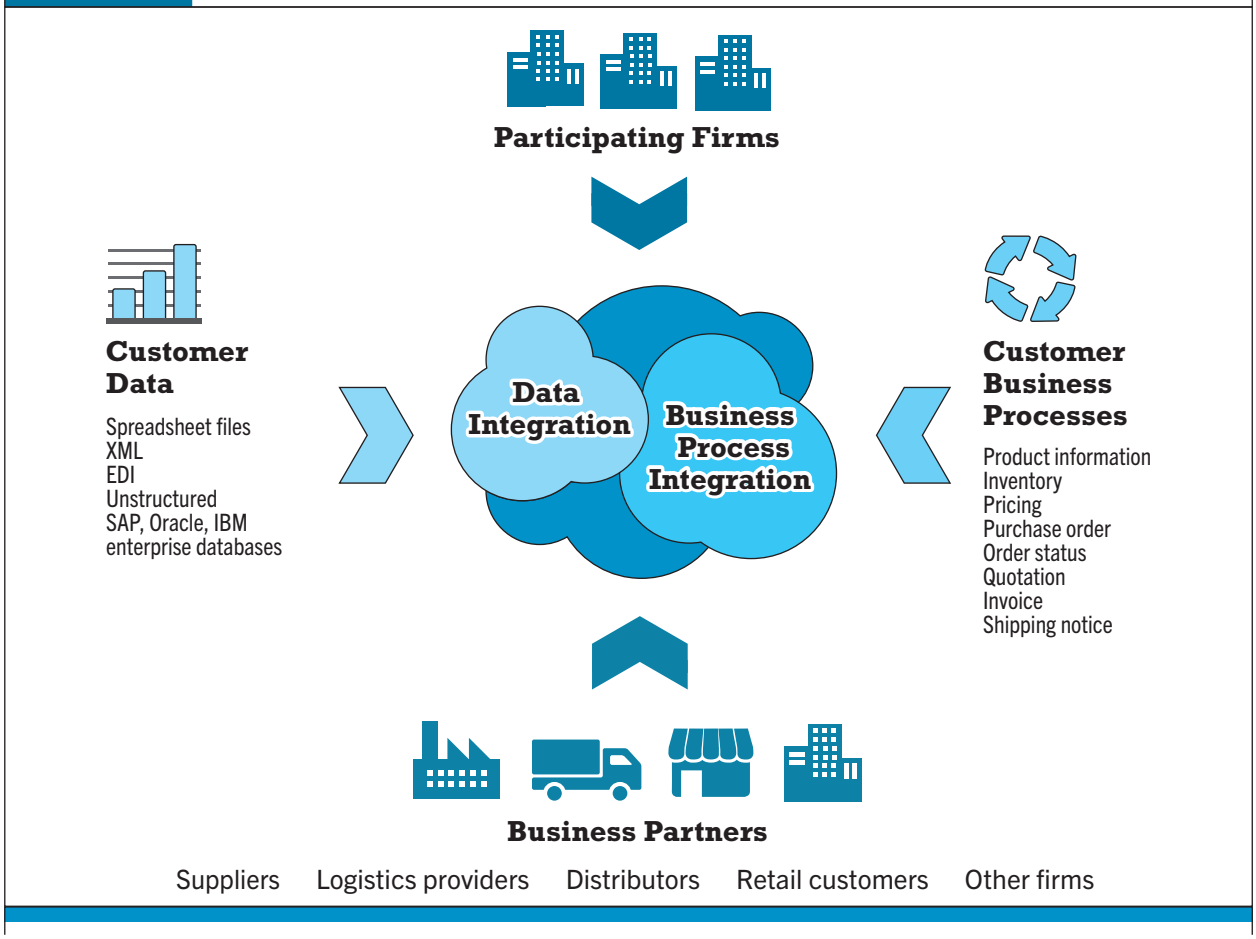
B2B IN THE CLOUD

In the traditional approach to B2B enterprise systems, firms build on their existing on-premises, enterprise production systems that keep track of their manufacturing and distribution processes to include new functionality connecting them to their suppliers' systems. This is a very expensive process that involves connecting suppliers one at a time, establishing the telecommunications channels, and managing the data quality issues, not to mention the cost of building the infrastructure of computers and telecommunications to support coordination of suppliers and B2B transactions. Cloud computing (described in Chapter 3) is increasingly being used to greatly reduce the cost of building and maintaining B2B systems.

cloud-based B2B system
shifts much of the expense of B2B systems from the firm to a B2B network provider, sometimes called a data hub or B2B platform

In **cloud-based B2B systems**, much of the expense of B2B systems is shifted from the firm to a B2B network provider, sometimes called a data hub or B2B platform (see **Figure 12.6**). The cloud platform owner provides the computing and telecommunications capability; establishes connections with the firm's partners; provides software on-demand (software as a service or SaaS) to connect the firm's systems to its partners' systems; performs data coordination and cleaning; and manages data quality for all members. Network effects apply here: The cost of these tasks and capabilities is spread over all members, reducing costs for all. B2B network providers also provide communication environments and file storage services that allow partners to work together more closely, and to collaborate on improving the flow of goods and transactions. B2B network providers charge customers on a demand basis, rather than on a percentage of their transactions' value, depending on their utilization of the network. Suppliers of traditional on-premises B2B and supply chain management systems, such as SAP, have responded by purchasing cloud-based B2B networks. For instance, SAP, the largest supplier of firm enterprise systems, purchased Ariba, one of the first and largest cloud-based B2B transaction networks, for $4.6 billion. Other cloud-based B2B providers

FIGURE 12.6 CLOUD-BASED B2B PLATFORMS



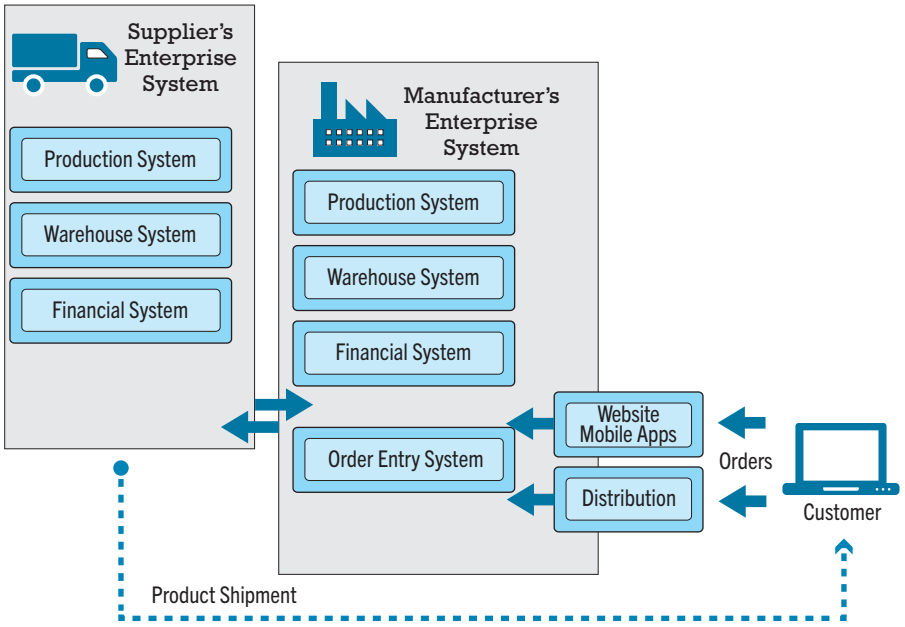
Cloud-based B2B platforms integrate a firm's customer data, business processes, and business partners into a cloud-based software system. Businesses are charged for the hardware and software platform on a utilization basis, reducing their costs significantly.

include E2Open, Infor Nexus, and Elementum. Unlike traditional firm-based B2B systems, cloud-based B2B can be implemented in short periods of time to respond to corporate mergers and rapidly changing markets. Salesforce, known for its cloud CRM systems, has also developed a B2B e-commerce platform that enables firms to quickly deploy websites with features unique to B2B e-commerce, such as complex pricing and product configurations, customized catalogs, payment and shipping options; to match e-commerce transactions with CRM data; and to link multiple sales channels with orders and firms (Salesforce, 2022).

SUPPLY CHAIN MANAGEMENT SYSTEMS

Supply chain simplification, just-in-time and lean production, focusing on strategic partners in the production process, enterprise systems, and continuous inventory replenishment are the foundation for contemporary supply chain management (SCM)

FIGURE 12.7 SUPPLY CHAIN MANAGEMENT SYSTEMS



SCM systems coordinate the activities of suppliers, shippers, and order entry systems to automate order entry through production, payment, and shipping business processes. Increasingly customers, as well as employees working throughout the supply chain, are using smartphones, tablets, and mobile apps to place and coordinate orders.

supply chain management (SCM) systems continuously link the activities of buying, making, and moving products from suppliers to purchasing firms, as well as integrating the demand side of the business equation by including the order entry system in the process

systems. **Supply chain management (SCM) systems** continuously link the activities of buying, making, and moving products from suppliers to purchasing firms, as well as integrating the demand side of the business equation by including the order entry system in the process (see **Figure 12.7**). Contemporary supply chain management systems increase transparency and responsiveness because all the activities in the supply chain are able to interact with one another in near real-time, enabling companies to establish interconnected networks of what had been discrete, siloed supply chain processes and to manage their supply chains more flexibly. However, the Covid-19 pandemic revealed the shortcomings of even the most up-to-date SCM systems, as in many cases, the models and algorithms employed by the systems were not able to accurately predict demand (Wetsman, 2020). One tool that businesses are turning to is an AI-powered simulation known as a digital twin. A digital twin involves creating a digital simulation of a complex real-world system such as a supply chain. Having a digital twin allows companies to "stress-test" their supply chains with various scenarios and develop alternate strategies. For example, Micron Technology, a major semiconductor company, has created a digital twin representing their end-to-end physical supply chain. The digital twin enables Micron to evaluate the behavior of its supply chain under different supply and demand

conditions, as well as the impact of potential responses, in a digital environment before taking actual action (Lawton, 2022; Heaven, 2021).

HP is one of the largest technology companies in the world. With operations in 60 countries, sales in 43 currencies, and 15 languages, HP is truly a global firm with global supply chain issues that became even more complicated as HP expanded by making more than 200 acquisitions in the last decade. In 2022, HP has one of the largest supply chains among information technology manufacturers. HP ships 35 personal computers, 26 printers, and 280 ink and toner cartridges into more than 100 countries every second! In a year, HP ships 52 million computers. Its supply chain needs to operate 24/7 to coordinate a network of factories, hundreds of suppliers, and distribution and logistics partner firms. To cope with one of the most complex supply chains in the world, HP developed a web-based, order-driven supply chain management system that begins with either a customer placing an order online or the receipt of an order from a dealer. The order is forwarded from the order entry system to HP's production and delivery system. From there, the order is routed to one of several HP contractor supplier firms. The supplier's system then verifies the order with HP and validates the ordered configuration to ensure the PC can be manufactured (e.g., will not have missing parts or fail a design specification set by HP). The order is then forwarded to a production control system that issues a bar-coded production ticket to factory assemblers. Simultaneously, a parts order is forwarded to the supplier's warehouse and inventory management system. A worker assembles the computer, and then the computer is boxed, tagged, and shipped to the customer. The delivery is monitored and tracked by HP's supply chain management system, which links directly to one of several overnight delivery systems. The elapsed time from order entry to shipping is 48 hours. With this system, HP has eliminated the need to hold PCs in inventory, reduced cycle time from one week to less than 48 hours, and reduced errors. HP has extended this system to become a global B2B order tracking, reporting, and support system for HP B2B customers (HP Inc., 2021; Wadlow, 2017).

It isn't just huge technology companies that use supply chain software. Under Armour, a leading performance athletic brand, first implemented an enterprise resource planning system when it was a $250 million domestic wholesale apparel company. But as it developed into a multibillion-dollar global omnichannel retail company, it outgrew its original system. Under Armour decided to replatform the entire company with software from SAP to predict sales, plan inventory, and coordinate suppliers across North America and Europe. Implementing the new system proved difficult and initially caused disruptions in its supply chain, impeding productivity and profitability. However, once the system was fully functional, it provided a foundation for improving Under Armour's supply chain performance. In 2021, Under Armour continued its supply chain evolution by migrating its SAP systems to Amazon Web Services (Baumann, 2021; Hilao, 2021).

BLOCKCHAIN, THE INTERNET OF THINGS, AND SUPPLY CHAIN MANAGEMENT

Blockchain, coupled with the Internet of Things (IoT), promises to bring about a transformation in supply chain management. In the process, it is expected to eventually replace legacy EDI technology with a nearly zero-cost alternative. As discussed in Chapter 5, blockchain is a transaction database that operates on a distributed P2P network that connects all

the participant members in a single database that is highly secure, reliable, resilient, and inexpensive. A blockchain ledger enables all parties to a transaction to add blocks of information to the shared ledger after a validation algorithm approves the transaction. If the parties to a transaction agree it is valid, then it is added to the chain of blocks pertaining to the transaction. The identities of the originators of the transaction are digitally encrypted, and the transaction itself is encrypted, cannot be changed, and is always up-to-date and available to all parties in near real time. The Internet of Things (IoT) (see Chapter 3) enables organizations to track individual units of components and finished inventory, as well as collect new types of data from different stages of their supply chain. Transaction data from IoT devices can be recorded in the blockchain (Gross, 2021; Gaur, 2021).

Blockchain, coupled with IoT, solves a number of problems with current transaction databases that firms use to keep track of products, orders, payments, shipments, customs requirements, and visibility into the supply chain. Currently, firms that are a party to a transaction have their own separate transaction systems, which can frequently be out of sync and do not communicate with one another. For instance, a mango grown in Mexico and bound for a Whole Foods' distribution center involves the grower, a Mexican trucking company, customs officials, a warehouse in the United States, and ultimately a U.S. trucking company to deliver the goods to retail outlets, as well as a retail inventory system and a shelf management system that tracks where the mango is placed in the store. Each of the firms involved in this supply chain have separate transaction processing systems. Innumerable documents are created in the process. Tracing a shipment of mangos through this maze of systems is extremely difficult, inefficient, unreliable, and costly.

Blockchain offers a simpler solution to this complex traditional system by creating a single database and a single instance of all the information needed to track the movement of mangos through the supply chain. Blockchain also offers the ability of all the parties involved in a transaction to access all this information in what is called a "master ledger" that solves the visibility problem that plagues traditional supply chains.

While the technology for blockchain is widely available, implementing blockchain supply chains is still in its infancy, but growing rapidly. For instance, Walmart is using blockchain in its Food Traceability Initiative to enable it to trace various products such as fresh leafy greens from farm to store. Walmart Canada used blockchain to create an automated system, called DL Freight, to manage freight carrier invoices, which typically include more than 200 data points that need to be factored into payment from its 70 third-party freight carriers. The system automatically captures and synchronizes information, from the offer from the carrier, to proof of delivery, to final payment, and has all but eliminated payment disputes, which have been reduced from 70% of invoices to less than 1%. Many other industries are also using blockchain. Financial institutions are using it to track home deeds and mortgages; the music industry is using blockchain to track songs from writers to producers and record companies, to their play by streaming services. Shipping companies are using blockchain and IoT to keep track of containers, while pharmaceutical companies are using blockchain in the drug supply chain. Industry experts believe that the enhanced visibility that blockchain can bring to the supply chain will also play a role in making supply chains more resilient (Vitasek, et al., 2022; Brown, 2021; Burstyn, 2020; Canesin, 2020). The *Insight on Technology case, Blockchain Takes on the Diamond Supply Chain*, illustrates how firms in the diamond industry are using blockchain today.

COLLABORATIVE COMMERCE

Collaborative commerce is a direct extension of supply chain management systems, as well as supply chain simplification. **Collaborative commerce** is defined as the use of digital technologies to permit firms to collaboratively design, develop, build, market, and manage products throughout their life cycles. This is a much broader mission than EDI or simply managing the flow of information among organizations. Collaborative commerce involves a definitive move from a transaction focus to a relationship focus among the supply chain participants. Rather than having an arm's-length adversarial relationship with suppliers, collaborative commerce fosters sharing of sensitive internal information with suppliers and purchasers. Managing collaborative commerce requires knowing exactly what information to share with whom. Collaborative commerce extends beyond supply chain management activities to include the collaborative development of new products and services by multiple cooperating firms.

collaborative commerce the use of digital technologies to permit organizations to collaboratively design, develop, build, and manage products throughout their life cycles

A good example of collaborative commerce is the long-term effort of Procter & Gamble (P&G)—the world's largest manufacturer of personal and health care products, from Crest toothpaste to Tide soap—to work with suppliers and even customers to develop its product line. Using SAP Ariba's procurement network, P&G asks its suppliers to come up with innovative ideas for packaging and pricing. Taking it a step further, P&G's website, Pgconnectdevelop.com, solicits new product ideas from suppliers and customers. More than 50% of P&G's new products originate with substantial input from its suppliers and customers. P&G is also collaborating with its biggest online customer, Amazon, by co-locating their operations. P&G sets aside warehouse space for P&G products available to Amazon customers. Amazon ships the products to its customers directly from the P&G warehouses rather than shipping them first to Amazon warehouses and then to the consumer. This collaboration results in Amazon reducing its costs of shipping and storing goods, becoming more competitive on price compared to Walmart and Costco, and reducing the time it takes for goods to arrive at consumers' homes. For P&G, collaboration means savings on transportation costs and boosting online sales of P&G products on Amazon (P&G, 2022).

Although collaborative commerce can involve customers as well as suppliers in the development of products, for the most part, it is concerned with the development of a rich communications environment to enable inter-firm sharing of designs, production plans, inventory levels, delivery schedules, and the development of shared products (see **Figure 12.8** on page 736).

Collaborative commerce is very different from EDI, which is a technology for structured communications among firms. Collaborative commerce is more like an interactive teleconference among members of the supply chain. EDI and collaborative commerce share one characteristic: They are not open, competitive marketplaces, but instead are, technically, private B2B networks that connect strategic partners in a supply chain.

INSIGHT ON TECHNOLOGY

BLOCKCHAIN TAKES ON THE DIAMOND SUPPLY CHAIN

Most people have heard the phrase "a diamond is forever," an advertising tagline created in the late 1940s by an ad agency working for De Beers, the world's largest diamond merchant. In addition to alluding to the fact that a diamond is the hardest natural substance on Earth, the slogan was intended to connote that a diamond is a never-ending sign of love and a never-ending source of value.

Fifty years later, the romance with diamonds began to fade, and De Beers, along with other major diamond merchants, found itself in the crosshairs of a major international scandal. In the late 1990s and continuing through the 2000s, a number of violent civil wars occurred in West Africa, starting in the Congo, and ultimately spreading to nine West African countries, resulting in the deaths of more than 5 million people and in 2 million homeless refugees. Diamonds and other minerals are considered to have been a primary cause of the conflict as opposing groups fought for control of the Congo's diamonds, cobalt, gold, and other minerals. During the civil wars, various private military groups exploited local populations by creating forced labor camps at diamond mining sites. These paramilitary groups used the sale of diamonds to fund arms purchases and pay mercenary soldiers. These diamonds became known as "blood diamonds" or "conflict diamonds." Suddenly the phrase "a diamond is forever" lost its cachet. That fabulous diamond ring was perhaps no longer so desirable for politically conscious purchasers.

Industry and government efforts to end the blood diamond trade resulted in the UN-sponsored Kimberley Process agreement in 2000. Eighty-one member nations agreed to prohibit diamond trade with nonmember countries. The major diamond merchants agreed that only certified rough diamonds would be purchased, cut, and sold to consumers. However, while still in effect today, the Kimberley Process agreement largely failed to remove blood diamonds from the supply chain, primarily because there was no enforcement mechanism and no way to identify and trace the movement of individual rough diamonds throughout the supply chain. Fake certificates, counterfeiters, and fake diamonds proliferated throughout the market. While the controversy has not had much effect on the sale of diamonds thus far, the failure to effectively prevent blood diamonds from seeping into the supply chain is a long-term threat to public perception of the diamond industry, as well as to its marketing messages.

Enter blockchain. The existing diamond supply chain had a number of challenges. First, it was impossible to precisely identify individual diamonds at the mine, and fake or blood diamonds could easily be inserted into the supply chain further down the line. There was no transparency as the rough diamond moved from miners to retail stores. Theft and diversion were a constant worry as there was no secure way of identifying the participants in the industry. Overall, there was no coordination among all the various actors in the chain. Blockchain promises a solution to these challenges by creating a secure digital trail for each diamond as it moves from mine to retail store.

In May 2018, De Beers Group announced that it had successfully tracked 100 high-value

diamonds through the entire diamond value train in a pilot test of its Tracr blockchain system. There are nine groups that "touch" diamonds as they move from mine to retail showcase: mining firms; banks; bulk purchasers (called sightholders); diamond offices (such as Antwerp World Diamond Center, a Belgian government-authorized corporation that controls the of diamonds to Belgium, considered the diamond capital of the world); diamond traders; government agencies; logistics firms; graders and cutters; and retailers. These key players constitute the nodes of the distributed P2P database.

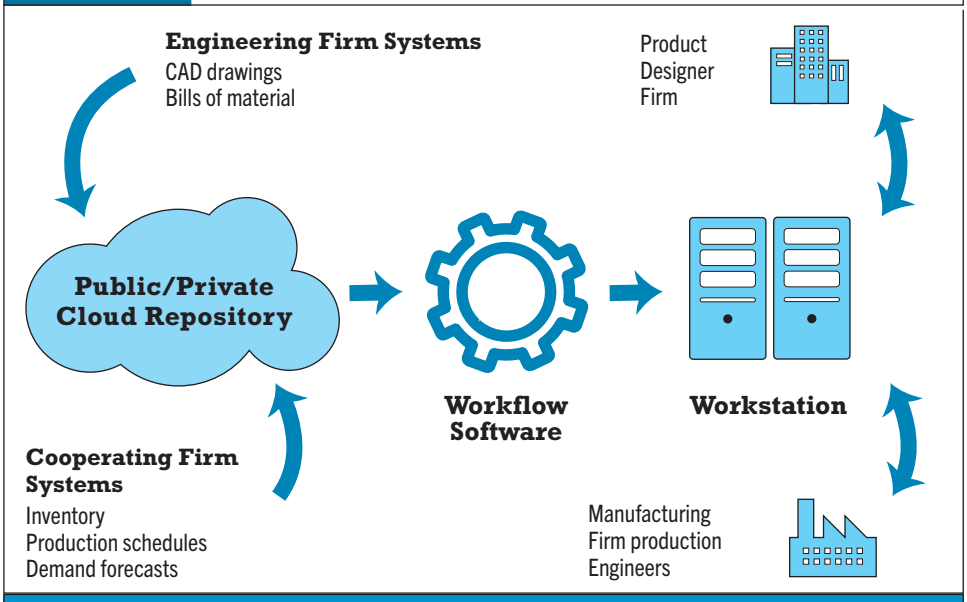
As rough diamonds are discovered they are given a unique Global Diamond ID that reflects the attributes of the diamond (carat, color, and clarity), as well as a 3D digital image of the diamond, to verify authenticity. This foundation forms the first block of the blockchain. Additional blocks are added at each touch point or transaction in the supply chain. Each of the participants in the supply chain is given a unique and secure encrypted digital certificate. Transactions are encrypted using an asymmetric (public and private key) method. The transactions that occur at each point are verified by each of the nodes in the P2P distributed computing system. No transactions can occur unless all the nodes agree that the transaction is valid and conforms to industry-standard smart contracts. Transactions cannot be changed. The provenance and history of the rough diamond, as well as all the smaller cut stones derived from it, are additional blocks in the chain. If it all works out, for the first time, retailers will be able to identify the authenticity of the diamonds in the retail store, and consumers can be assured of the origins and quality of their purchases. And the diamond industry will be able to definitively declare that there are no blood diamonds in the supply chain.

De Beers launched Tracr commercially as a platform in 2020 and already has more than 30 participants, including Alrosa, the world's largest diamond producer by volume; Signet Jewelers, the world's largest retailer of diamond jewelry; and Chow Tai Fook Jewelry Group, the world's second-largest dealer. By 2022, De Beers had registered more than 400,000 diamonds on the platform, worth more than $2 billion, and the Tracr platform was recognized as a leading global blockchain innovation by Forbes in its Blockchain 50 list in both 2020 and 2022.

De Beers is not alone in diamond blockchains. Everledger is a London-based company that started building a diamond blockchain in 2015. It is currently being used by a number of jewelers, including Brilliant Earth, Fred Meyer Jewelers, online marketplace Rare Caret, as well as Spanish jewelry designer and manufacturer Facet. However, it remains to be seen if these new blockchain initiatives will be sufficient to eliminate blood diamonds. Even the most powerful encryption system can be compromised with sufficient effort and computing power and is only as secure as the humans who manage it.

SOURCES: "Brilliant Earth Is Using Blockhain to Buff Up the Image of Diamonds," by Sabrina Escobar, Barrons.com, March 15, 2022; "How De Beers Is Tracing Diamonds from Miner to Customers," by Ceri Jones, Cips.org, February 16, 2022; "Forbes Blockchain 50, 2022," Forbes.com, February 8, 2022; "De Beers' Tracr Project Gets New Head as It Moves to New Phase," by Rob Bates, Jckonline.com, May 7, 2021;"Diamond Marketplace Rare Caret Partners with Everledger for Blockchain Traceability," Ledgerinsights.com, January 12, 2021; "De Beers Group Successfully Tracks First Diamonds from Mine to Retail on Industry Blockchain," DeBeersGroup.com, May 10, 2018; "The Kimberley Process and the Unfulfilled Promise of a Conflict-Free Diamond Industry," by Khaled Fayyad, Duke University Law School, Sites.duke.edu, May 7, 2018; "How Blockchain Could End the Trade in Blood Diamonds," by Bernard Marr, Forbes.com, March 18, 2018; "De Beers Turns to Blockchain to Guarantee Diamond Purity," Reuters.com, January 16, 2018; "De Beers Faces Tricky Task of Selling Diamonds to Millennials," by Tatyana Shumsky, *Wall Street Journal*, October 29, 2017; "Diamonds Are Forever, Wars Are Not. Is Conflict Bad for Private Firms?" by Massimo Guidolin and Eliana La Ferrara, Research Paper, University of Virginia and Bocconi University, August 2014; "Violent Conflicts and Civil Strife in West Africa: Causes, Challenges and Prospects," by Nancy Annan, *International Journal of Security & Development*, 2014.

FIGURE 12.8 ELEMENTS OF A COLLABORATIVE COMMERCE SYSTEM



A collaborative commerce application includes a cloud repository where employees at several different firms can store engineering drawings and other documents. Workflow software determines who can see this data and what rules will apply for displaying the data on individual workstations.

Collaboration 2.0: Web, Cloud, Social, and Mobile

The technology of collaborative commerce has changed greatly since its inception more than 30 years ago with tools like Lotus Notes, which was used almost entirely within firms to establish an environment where employees could share ideas, notes, and ideas and work on projects together. What's new about collaboration tools today is that the Web enables very inexpensive collaborative environments; the software and data are stored on cloud servers, where it is less expensive and easy to update; social networks like LinkedIn, Facebook and Twitter are commonly used by employees in many firms, while other firms deploy their own internal social network platform; and the mobile platform of smartphones and tablets means that collaboration can take place in many more places and times. Collaboration technologies have expanded collaboration from a within-the-firm platform to a primary tool of inter-firm B2B collaboration.

Videoconference systems like Cisco's TelePresence also play a role in enabling frequent, long-distance collaboration among supply chain partners. TelePresence is one of several high-bandwidth video systems from different vendors that give users the impression they are sharing physical space with other participants who are in fact located remotely, sometimes on the other side of the globe. Even small businesses can take advantage of inexpensive online collaborative platforms such as Microsoft Teams, as well as low-cost videoconferencing tools such as Zoom.

In Section 12.5, we discuss collaborative commerce in greater depth as a technology that enables private B2B networks.

SOCIAL NETWORKS AND B2B: THE EXTENDED SOCIAL ENTERPRISE

It's a short step from collaboration with vendors, suppliers, and customers to a more personal relationship based on conversations with participants in the supply chain using social networks—both private and public. Here, the conversations and sharing of ideas are more unstructured, situational, and personal. Procurement officers, managers of supply chains, and logistics managers are people too, and they participate in the same social network culture provided by LinkedIn, Facebook, Twitter, Instagram, and a host of other public social networks that we all do. Being able to respond to quickly moving developments that affect supply chains requires something more than a website, e-mail, or telephone call. Social networks can provide the intimate connections among customers, suppliers, and logistics partners that are needed to keep the supply chain functioning and to make decisions based on current conditions.

Participants in the supply chain network are tapping into their social networks for purchasing, scheduling, exception handling, and deciding with their B2B customers and suppliers. In many cases, supply chain social networks are private: owned by the largest firm in the supply chain network. In other cases, firms develop Facebook groups to organize conversations among supply chain network members.

Social networks have become common tools for managers engaged in B2B e-commerce. Public social network sites like Facebook and Twitter can be excellent for coordinating the flow of information among business partners throughout the supply chain. Cisco is using its website, Twitter, and Facebook to run new product campaigns for its business customers using social networks exclusively. Dell, like many businesses, uses its YouTube channel to engage suppliers and customers in conversations about existing products and ideas for new products (Insider Intelligence/eMarketer, 2020a, 2019).

B2B MARKETING

B2B marketing is increasingly becoming an important initiative in B2B e-commerce, although the total amount spent (around $12 billion in 2021) still accounts for only about 6% of the total amount spent on all digital marketing and advertising. However, the amount of spending is growing at more than 15% annually and has more than doubled since 2018. About 55% of B2B ad spending is aimed at desktops, and 45% is aimed at mobile devices. The amount spent on mobile B2B advertising has also more than doubled since 2018 (Insider Intelligence/eMarketer, 2022b). B2B firms are increasingly going digital and mobile.

Nevertheless, B2B digital marketing and advertising has not grown nearly as quickly as its B2C counterpart, partly because of the slow pace of technological change in supply chain and procurement management but mostly because the B2B marketplace is fundamentally different from the B2C marketplace. In B2C marketing, firms aim at a large mass audience in the millions (one-to-many) with comparatively simple products with relatively low value, whereas many B2B firms sell low volumes of very valuable and complex products to a much small number of purchasers (one-to-one, or one to a few). In these B2B markets, face-to-face, traditional salesforce marketing continues to play a large role, although, through necessity, the Covid-19 pandemic drove a shift away from face-to-face, in-person marketing toward digital channels. In addition, commercial relationships in the B2B space often involve large purchases and relationships that can span several years or longer. The sellers and buyers may have known about each other for years, even decades; the capabilities and financial situations of the firms are known. Both parties share an understanding

of the price and quality of what is being exchanged in the market. In these situations, B2C retail marketing tactics are not appropriate. Instead, interpersonal relationships, networking, brand, and informative content marketing using white papers, videos, podcasts, webinars, blogs, e-books, conferences, and professional associations are the primary and most effective marketing tools. Content marketing refers to using informative media to promote sales rather than advertising the availability and price typical of display and search advertising in B2C markets (see Chapter 6). E-mail and social media also play a role in content marketing by making potential customers aware of new content. LinkedIn is the most common social network used for B2B marketing (Insider Intelligence/eMarketer, 2021b, 2020b).

However, in spot purchase markets for MRO or other commodity products, B2B marketing uses many of the same marketing tactics and tools found in B2C marketing: display ads, search engine marketing, websites, social network channels, videos, and mobile ads.

Mobile apps are growing in importance but are not as central as they are for B2C marketing, in part because the small screen is not a good environment to describe complex products, and B2B purchasers, while they may be spending three hours a day or more on their mobile devices, are mostly engaged in socializing and consuming, not B2B activities. Nevertheless, the use of mobile advertising in B2B marketing has grown as mobile devices play a larger role in workplaces and social life, especially among Millennials. According to a recent report, 90% of B2B marketers surveyed used at least some mobile marketing technologies, with more than 70% characterizing their usage as either advanced or intermediate. Mobile-friendly websites and apps have become important priorities for B2B marketers. Mobile B2B marketing is growing and now consumes about 45% of B2B digital marketing budgets (Insider Intelligence/eMarketer, 2022b).

Other trends in B2B marketing include sales enablement systems, the use of predictive analytics, and personalized marketing techniques. Sales enablement systems keep track of leads developed from websites, e-mail, and mobile apps, and help the salesforce track these prospective customers through the point of purchase. Predictive analytics help B2B marketers estimate the lifetime value of leads based on past marketing data. A survey of B2B marketers found that almost 95% were using web analytics, almost 85% were using CRM systems, and more than 70% were using content management systems to improve their marketing effectiveness, enabling them to better know and understand their target customers by receiving more accurate and precise personalization (Insider Intelligence/eMarketer, 2019).

12.4 B2B E-COMMERCE MARKETPLACES: THE SELLING SIDE OF B2B

One of the most compelling visions of B2B e-commerce is that of an online marketplace that would bring thousands of fragmented suppliers into contact with hundreds of major purchasers of industrial goods for the purpose of conducting frictionless commerce. The hope was that these suppliers would compete with one another on price, transactions would be automated and low cost, and as a result, the price of industrial supplies would fall. By extracting fees from buyers and sellers on each transaction, third-party intermediary market makers could earn significant revenues. B2B e-commerce marketplaces are sell-side digital environments that bring suppliers and buyers together.

CHARACTERISTICS OF B2B E-COMMERCE MARKETPLACES

There is a confusing variety of B2B e-commerce marketplaces today and several different ways to classify them. For instance, some classify B2B e-commerce marketplaces on the basis of their pricing mechanisms (fixed prices or more dynamic pricing, such as negotiation, auction, or bid/ask), while others classify markets based on characteristics of the markets they serve (vertical versus horizontal, or sell-side versus buy-side), or ownership (independent third-party intermediaries [which is most common] or industry-owned consortia). Although the primary benefits and biases of B2B e-commerce marketplaces have to be determined on a case-by-case basis depending on ownership and pricing mechanisms, it is often the case that B2B e-commerce marketplaces are biased against suppliers because these marketplaces can force suppliers to reveal their prices and terms to other suppliers in the marketplace. **Table 12.3** describes some of the important characteristics of B2B e-commerce marketplaces.

TYPES OF B2B E-COMMERCE MARKETPLACES

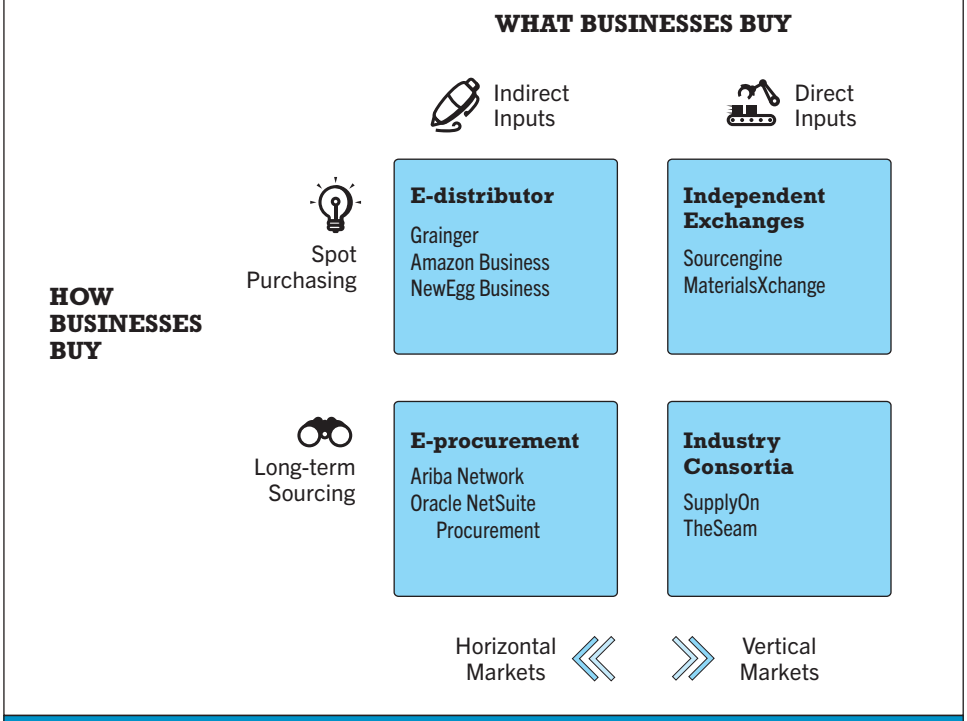
Although each of these distinctions helps describe the phenomenon of B2B e-commerce marketplaces, they do not focus on the central business functionality provided, nor are they capable by themselves of describing the variety of B2B e-commerce marketplaces.

In **Figure 12.9**, we present a classification of B2B e-commerce marketplaces that focuses on their business functionality; that is, what these marketplaces provide for businesses seeking solutions. We use two dimensions of B2B e-commerce marketplaces to create a four-cell classification table. We differentiate marketplaces as providing either indirect goods (goods used to support production) or direct goods (goods used in production), and we distinguish markets as providing either contractual purchasing (where purchases take place over many years according to a contract

TABLE 12.3 CHARACTERISTICS OF B2B E-COMMERCE MARKETPLACES: A B2B VOCABULARY

CHARACTERISTIC	MEANING
Bias	Sell-side vs. buy-side vs. neutral. Whose interests are advantaged: buyers, sellers, or no bias?
Ownership	Industry vs. third party. Who owns the marketplace?
Pricing mechanism	Fixed-price catalogs, auctions, bid/ask, and RFPs/RFQs.
Scope/Focus	Horizontal vs. vertical markets.
Value creation	What benefits do they offer customers or suppliers?
Access to market	In public markets, any firm can enter, but in private markets, entry is by invitation only.

FIGURE 12.9 TYPES OF B2B E-COMMERCE MARKETPLACES



There are four main types of B2B e-commerce marketplaces based on the intersection of two dimensions: how businesses buy and what they buy. A third dimension—horizontal versus vertical markets—also distinguishes the different types of B2B e-commerce marketplaces.

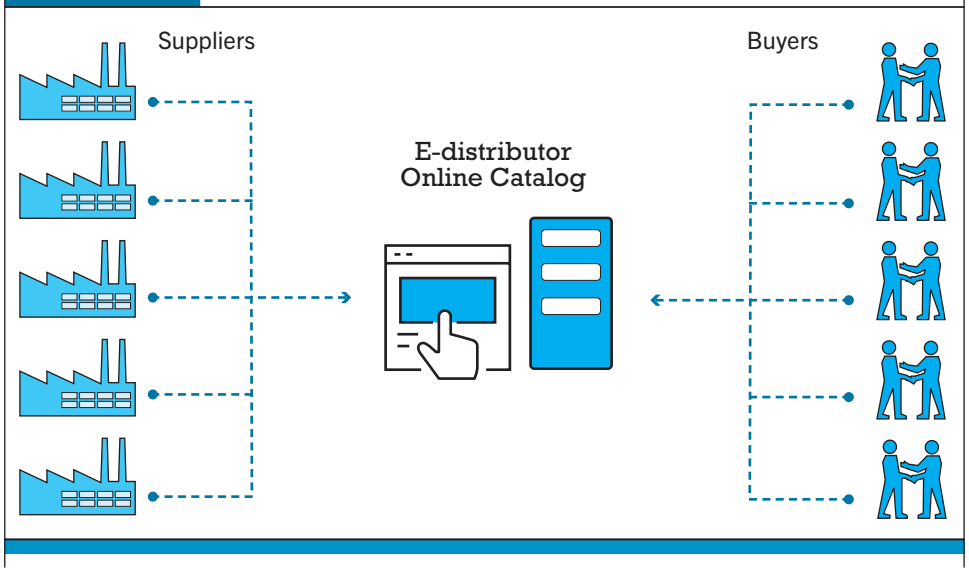
between the firm and its vendor) or spot purchasing (where purchases are episodic and anonymous—vendors and buyers do not have an ongoing relationship and may not know one another). The intersection of these dimensions produces four main types of B2B e-commerce marketplaces that are relatively straightforward: e-distributors, e-procurement networks, exchanges, and industry consortia. Note, however, that in the real world, some B2B e-commerce marketplaces can be found in multiple parts of this figure as business models change and opportunities appear and disappear. Each of these B2B e-commerce marketplaces seeks to provide value to customers in different ways. We discuss each type in more detail in the following sections.

E-distributors

e-distributor provides an online catalog that represents the products of thousands of direct manufacturers

E-distributors are the most common and most easily understood type of B2B e-commerce marketplace. An **e-distributor** provides an online catalog that represents the products of thousands of direct manufacturers (see **Figure 12.10**). E-distributors are independently owned intermediaries that offer industrial customers a single source from which to order indirect goods (often referred to as MRO goods) on a spot, as-needed basis. A significant percentage of corporate purchases cannot be satisfied under a company's existing contracts and must be purchased on a spot basis. E-distributors make money by charging a markup on products they distribute.

FIGURE 12.10 E-DISTRIBUTORS



E-distributors are firms that bring the products of thousands of suppliers into a single online catalog for sale to thousands of buyer firms. E-distributors are sometimes referred to as one-to-many markets: one seller serving many firms.

Organizations and firms in all industries require MRO supplies. The MRO function maintains, repairs, and operates commercial buildings and maintains all the machinery of these buildings from heating, ventilating, and air conditioning systems to lighting fixtures. Companies spent about $700 billion on MRO globally in 2021, and that amount is expected to grow to more than $785 billion by 2026 (Research and Markets, 2021).

E-distributors operate in horizontal markets because they serve many different industries with products from many different suppliers. E-distributors usually operate public markets in the sense that any firm can order from the catalog, as opposed to private markets, where membership is restricted to selected firms.

E-distributor prices are usually fixed, but large customers receive discounts and other incentives to purchase, such as credit, reporting on account activity, and limited forms of business purchasing rules (for instance, no purchases greater than $500 for a single item without a purchase order). The primary benefits offered to industrial customers are lower search costs, lower transaction costs, wide selection, rapid delivery, and low prices.

W.W. Grainger is one of the most frequently cited examples of an e-distributor. Grainger is involved in long-term systematic sourcing as well as spot sourcing, but its emphasis is on spot sourcing. Grainger is the largest distributor of MRO supplies in the United States and also operates in Canada, Mexico, the United Kingdom, and Japan. Grainger has two primary business segments. Its High-Touch Solutions business includes sales through its flagship Grainger.com e-commerce site and app, as well as more extensive and personalized services, and offers more than 2 million products. More than 75% of Grainger's U.S. High-Touch Solutions orders originate from a digital channel. Its Endless Assortment segment is an online-only channel that offers more than 30 million products in concert with third-party partners (W.W. Grainger, Inc., 2022). FleetPride, one of the nation's largest

distributors of truck and trailer parts and services, offers an online inventory of more than 175,000 parts that is searchable by part number, year/make/model/engine type, or vehicle identification number. NeweggBusiness, which is focused on IT and office products, is another example of an e-distributor. As you learned in the opening case, Amazon also entered the B2B distributor market with AmazonSupply, aiming to leverage its global B2C fulfillment infrastructure into the B2B arena, and in 2015, rebranded it as Amazon Business. Amazon Business primarily engages in spot sales of business products and provides a trading platform for multiple sellers. See the case study at the beginning of the chapter for more information about Amazon Business.

e-procurement company
independently owned intermediary that helps businesses automate their procurement processes and in some instances provides a marketplace that connects suppliers to buyers who pay a fee to join the market

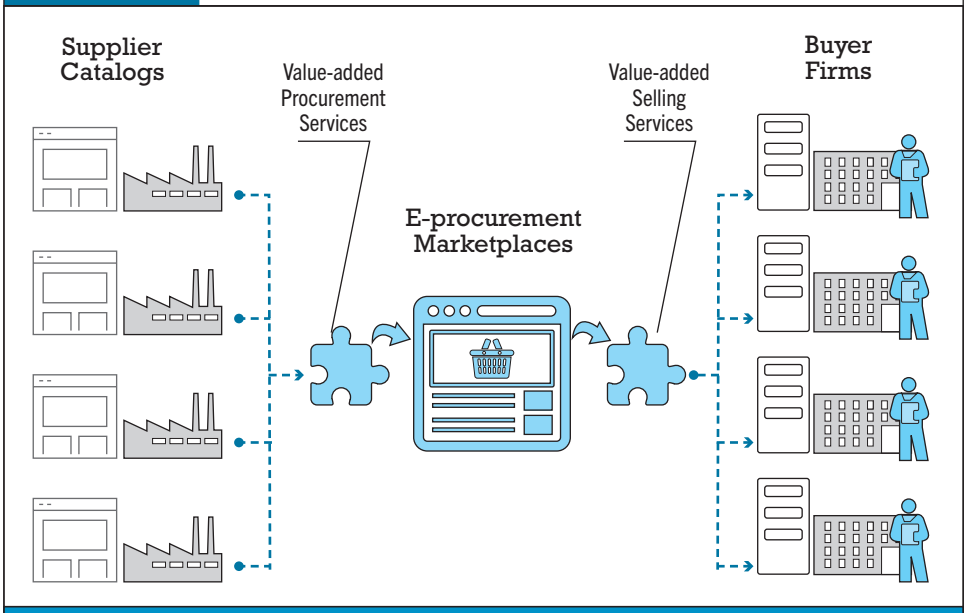
value chain management (VCM) services
include automation of a firm's entire procurement process on the buyer side and automation of the selling business processes on the seller side

E-procurement

An **e-procurement company** is an independently owned intermediary that helps businesses automate their procurement process and in some instances provides a marketplace that connects suppliers to buyers who pay a fee to join the market (see **Figure 12.11**). E-procurement marketplaces are typically used for long-term contractual purchasing of indirect goods (MRO); they create online horizontal markets, but they also provide for members' spot sourcing of MRO supplies. E-procurement companies make money by charging a percentage of each transaction, licensing consulting services and software, and assessing network use fees.

E-procurement companies expand on the business model of simpler e-distributors by including the online catalogs of hundreds of suppliers and offering value chain management services to both buyers and sellers. **Value chain management (VCM) services** provided by e-procurement companies include automation of a firm's entire

FIGURE 12.11 E-PROCUREMENT MARKETPLACES



E-procurement marketplaces aggregate hundreds of catalogs in a single marketplace and make them available to firms, often on a custom basis that reflects only the suppliers desired by the participating firms.

procurement process on the buyer side and automation of the selling business processes on the seller side. For purchasers, e-procurement companies automate purchase orders, requisitions, sourcing, business rules enforcement, invoicing, and payment. For suppliers, e-procurement companies provide catalog creation and content management, order management, fulfillment, invoicing, shipment, and settlement.

E-procurement marketplaces are sometimes referred to as many-to-many markets. They are mediated by an independent third party that purports to represent both buyers and sellers, and hence claims to be neutral. On the other hand, because they may include the catalogs of both competing suppliers and competing e-distributors, they likely have a bias in favor of the buyers. Nevertheless, by aggregating huge buyer firms into their networks, they provide distinct marketing benefits for suppliers and reduce customer acquisition costs.

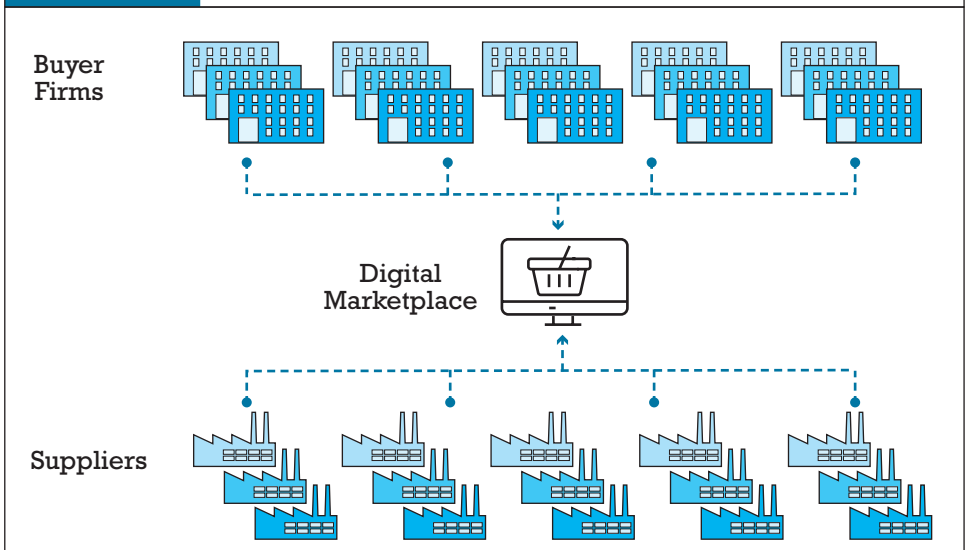
SAP Ariba is a leading provider of collaborative business commerce solutions and includes an e-procurement marketplace called the Ariba Network, with more than 6.7 million connected companies in 190 countries and more than $3.2 trillion in B2B e-commerce transactions annually (SAP Ariba, 2022). Other players in this market segment include Oracle NetSuite Procurement, Coupa, Proactis, and Jaggaer Spend Analytics.

exchange
independently owned B2B e-commerce marketplace that connects hundreds to potentially thousands of suppliers and buyers in a dynamic, real-time environment

Exchanges

An **exchange** is an independently owned B2B e-commerce marketplace that connects hundreds to potentially thousands of suppliers and buyers in a dynamic, real-time environment (see **Figure 12.12**). Although there are exceptions, exchanges generally create vertical markets that focus on the spot-purchasing requirements of large firms

FIGURE 12.12 EXCHANGES



Independent exchanges bring potentially thousands of suppliers to a vertical (industry-specific) B2B e-commerce marketplace to sell their goods to potentially thousands of buyer firms. Exchanges are sometimes referred to as many-to-many markets because they have many suppliers serving many buyer firms.

in a single industry, such as computers and telecommunications, electronics, food, and industrial equipment. Exchanges were the prototype B2B e-commerce marketplace in the early days of e-commerce.

Exchanges make money by charging a commission on the transaction. The pricing model can be through an online negotiation, auction, RFQ, or fixed buy-and-sell prices. The benefits offered to customers of exchanges include reduced search costs for parts and spare capacity. Other benefits include lower prices created by a global marketplace driven by competition among suppliers who would, presumably, sell goods at very low profit margins at one world-market price. The benefits offered suppliers are access to a global purchasing environment and the opportunity to unload production overruns (although at very competitive prices and low profit margins). Even though they are private intermediaries, exchanges are public in the sense of permitting any bona fide buyer or seller to participate.

Exchanges tend to be biased toward the buyer even though they are independently owned and presumably neutral. Suppliers are disadvantaged by the fact that exchanges put them in direct price competition with other, similar suppliers around the globe, driving profit margins down. Exchanges have failed in the past primarily because suppliers have refused to join them, and hence, the existing markets have very low liquidity, defeating the very purpose and benefits of an exchange. **Liquidity** is typically measured by the number of buyers and sellers in a market, the volume of transactions, and the size of transactions. You know a market is liquid when you can buy or sell just about any size order at just about any time you want. On all of these measures, many exchanges failed, resulting in a very small number of participants, few trades, and small trade value per transaction. The most common reason for not using exchanges is the absence of traditional, trusted suppliers.

liquidity
typically measured by the number of buyers and sellers in a market, the volume of transactions, and the size of transactions

While most exchanges tend to be vertical marketplaces offering direct supplies, some exchanges offer indirect inputs as well, such as electricity and power, transportation services (usually to the transportation industry), and professional services.

The following capsule descriptions of two exchanges provide insight into their origins and current functions. Inventory Locator Service (ILS) has its roots as an offline intermediary, serving as a listing service for aftermarket parts in the aerospace industry. ILS initially provided a telephone- and fax-based directory of aftermarket parts to airplane owners and mechanics, along with government procurement professionals. It later incorporated e-mail capabilities as part of its RFQ services and began to conduct online auctions for hard-to-find parts. Today, ILS maintains an online database of more than 1 billion aerospace industry parts and has more than 28,000 subscribers in more than 100 different countries (Inventory Locator Service, 2022).

Joor is a New York–based digital wholesale exchange that connects 13,300 fashion brands with more than 380,000 retailers in 150 countries in a multichannel digital trading platform. Founded in 2010 as an online wholesale fashion order entry site, it has since expanded into a full-service website and app for retailers that displays manufacturer brands, tracks orders, visualizes the assortment of fashions ordered, and coordinates looks for the coming season. Fashions and colors need to be planned by retailers and manufacturers two years in advance of their sale, and making sure the colors and look are appropriate is a difficult task that requires an overview of what has been purchased. Joor allows retailers to browse fashions by trend and exposes them to a wide

TABLE 12.4 EXAMPLES OF INDEPENDENT EXCHANGES

EXCHANGE	FOCUS
Sourcengine	Electronic components
MaterialsXchange	Wood products such as lumber and panels
IronPlanet	Used heavy equipment
Vori	Grocery industry
Molbase	Chemical compounds and custom chemicals

range of brands they may not have discovered in the past. Joor has increased the speed of buying and the quality of purchaser decisions. In the past, buying agents and fashion planners had to visit manufacturer websites or read fashion journals that could be months behind quickly changing fashions in order to discover the latest offerings and place orders. With Joor's digital platform, purchasing agents can quickly get a sense of the latest trends in fashion and place orders using a single web platform. For brands and designers, Joor simplifies marketing efforts with a built-in customer base of retailers. In 2021, Joor transacted $57 billion in wholesale transactions and handled more than 2,300 daily interactions between brands and retailers on the platform (Joor, 2022).

Table 12.4 lists a few examples of some current independent exchanges.

Industry Consortia

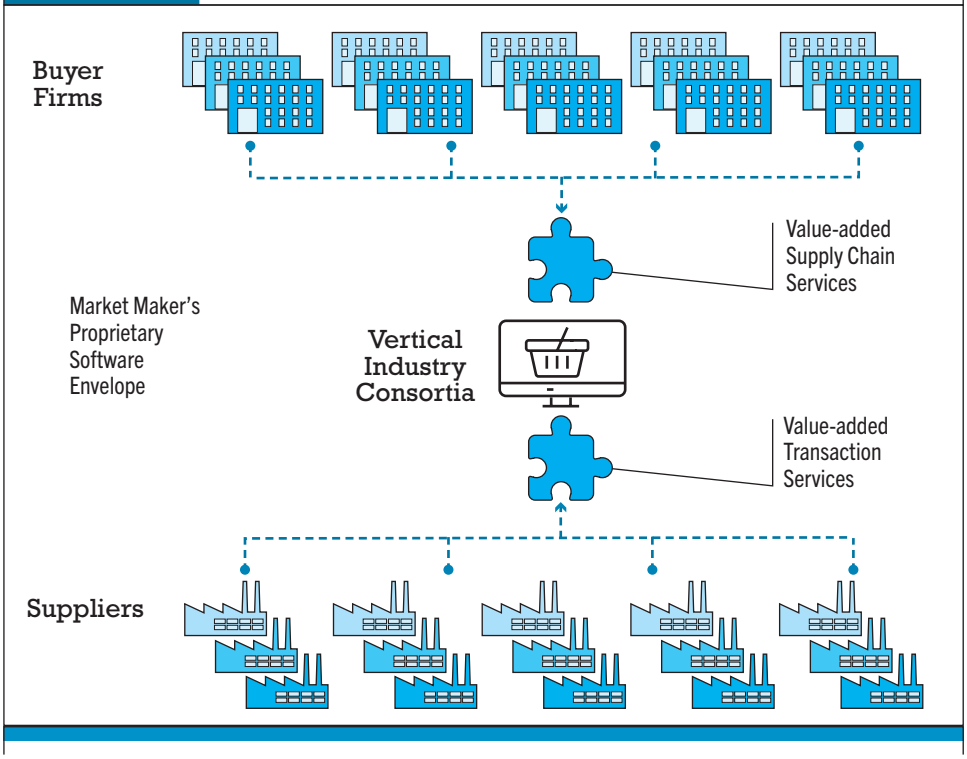
industry consortium industry-owned vertical market that enables buyers to purchase direct inputs (both goods and services) from a limited set of invited participants

An **industry consortium** is an industry-owned vertical market that enables buyers in the industry to purchase direct inputs (both goods and services) (see **Figure 12.13**). Industry consortia typically emphasize long-term contractual purchasing, the development of stable relationships (as opposed to merely an anonymous transaction emphasis), and the creation of industry-wide data standards and synchronization efforts. Industry consortia are more focused on optimizing long-term supply relationships than independent exchanges, which tend to focus more on short-term transactions. The ultimate objective of industry consortia is the unification of supply chains within entire industries, across many tiers, and through common data definitions, network standards, and computing platforms.

Industry consortia sprang up in part as a reaction to the development of independently owned exchanges, which were viewed by large industries (such as the automotive and chemical industries) as market interlopers that would not directly serve the interests of large buyers but would instead line their own pockets and those of their venture capital investors. Rather than "pay-to-play," large firms decided to "pay-to-own" their markets. Another concern of large firms was that exchanges would work only if large suppliers and buyers participated, and only if there was liquidity. In the early years of e-commerce, few independent exchanges were attracting enough players to achieve liquidity. In addition, exchanges often failed to provide additional value-added services that would transform the value chain for the entire industry, including linking the new marketplaces to firms' ERP systems.

The number of firms that can be defined as industry consortia has significantly declined since the early 2000s, with many firms being sold by the original industry founders to private investors or other companies. For example, GHX, founded by companies in

FIGURE 12.13 INDUSTRY CONSORTIA



Industry consortia bring thousands of suppliers into direct contact with a smaller number of very large buyers. The market makers provide value-added software services for procurement, transaction management, shipping, and payment for both buyers and suppliers. Industry consortia are sometimes referred to as many-to-few markets, where many suppliers (albeit selected by the buyers) serve a few very large buyers, mediated by a variety of value-added services.

the pharmaceutical and medical supply industry, is now owned by a private equity firm. E2open, founded by IBM, Seagate, and Hitachi as an industry consortium for companies in the high technology industries, has since become a public company and now provides a cloud-based B2B platform and services for a wide variety of industries. Avendra, founded by five major companies in the hospitality industry (Marriott, Hyatt, Fairmount Hotels, ClubCorp, and IHG) as a procurement service provider, was acquired by Aramark, a major food services and facilities provider across a number of industries. Elemica, profiled in the chapter-ending case study, was originally owned by Dow, Dupont, and other major players in the chemicals industry but is now owned by a private equity firm.

However, some industry consortia do remain. One example is SupplyOn, an industry consortium founded by automotive suppliers Bosch, Continental, Schaeffler, and ZF. SupplyOn has since expanded beyond the automotive industry to aerospace, railway, and manufacturing. Another example is The Seam, which was founded by leading global agribusiness companies such as Cargill, Louis Dreyfus, and others. The Seam focused initially on creating a cotton trading exchange, and has since expanded into other commodity segments, including peanuts, soybeans, grains, and dairy. The Seam has handled more than $9 billion in transactions since inception, and more than 90% of the cotton buyers in the United States are active participants in its Cotton Trading system. For instance, on April 27, 2022,

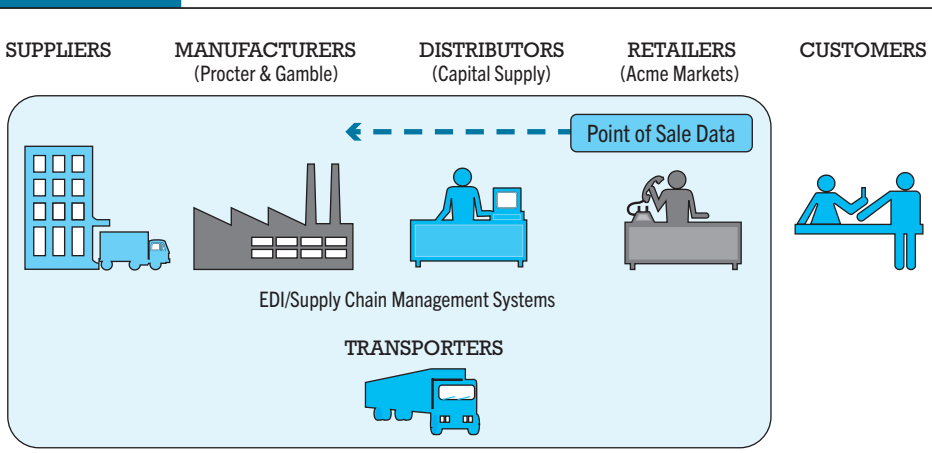
more than 1.6 million pounds of cotton were traded on The Seam's U.S. marketplace, enough to make more than 700,000 pairs of jeans (The Seam, 2022). BluePallet is another industry consortium, built with the support and advice of The National Association of Chemical Distributors (NACD) and its 400-plus members and affiliate companies.

12.5 PRIVATE B2B NETWORKS

Private B2B networks are the most prevalent form of B2B e-commerce in terms of transaction volume and are expected to continue to be so into the foreseeable future. Private B2B networks can be considered the foundation of the extended enterprise, allowing firms to extend their boundaries and their business processes to include supply chain and logistics partners.

As noted at the beginning of this chapter, private B2B networks are direct descendants of existing EDI networks and are closely tied to existing ERP systems used by large firms. Like EDI, private B2B networks are owned by the buyers and are buyer-side solutions with buyer biases, but they offer significant benefits for suppliers as well. Inclusion in the direct supply chain for a major company can allow a supplier to increase both revenue and margins because the environment is not competitive—only a few suppliers are included in the private B2B network. A private B2B network is an Internet-enabled network for the coordination of collaborative commerce. Private B2B networks can be viewed as extended enterprises in the sense that they often begin as ERP systems in a single firm and are then expanded to include the firm's major suppliers. **Figure 12.14** illustrates a private B2B network originally built by Procter & Gamble (P&G) in the United States to coordinate supply chains among its suppliers, distributors, transporters, and retailers.

FIGURE 12.14 PROCTER & GAMBLE'S PRIVATE B2B NETWORK



Procter & Gamble's private B2B network attempts to coordinate the trans-organizational business processes of the many firms it deals with in the consumer products industry.

In P&G's private B2B network, shown in Figure 12.14, customer sales are captured at the cash register, which then initiates a flow of information back to distributors, P&G, and its suppliers. This tells P&G and its more than 70,000 suppliers the exact level of demand for thousands of products. This information is then used to initiate production, supply, and transportation to replenish products at the distributors and retailers. This process is called an efficient customer response system (a demand-pull production model), and it relies on an equally efficient supply chain management system to coordinate the supply side. In 2015, P&G began the process of transforming its supply chain system into a fully integrated, end-to-end supply base that enables the creation of joint business plans with its suppliers. Coordinating this supply base is a control tower environment, replete with wrap-around room monitors, where real-time supply data is continuously analyzed by teams of analysts. P&G's distribution goal is to deliver products within one day of shipping to 80% of its retailers. P&G is the world's largest consumer goods manufacturer, and for many years has been ranked as a leading supply chain system. In recent years, it has invested heavily in creating a more flexible supply chain. (Terlep, 2021; Gartner, 2021).

GE, Dell, Cisco, Volkswagen, Microsoft, IBM, Nike, Coca-Cola, Walmart, Nokia, and HP are among the firms operating successful private B2B networks.

OBJECTIVES OF PRIVATE B2B NETWORKS

The specific objectives of a private B2B network include:

- Developing efficient purchasing and selling business processes industry-wide
- Developing industry-wide resource planning to supplement enterprise-wide resource planning
- Increasing supply chain visibility—knowing the inventory levels of buyers and suppliers
- Achieving closer buyer-supplier relationships, including demand forecasting, communications, and conflict resolution
- Operating on a global scale—globalization
- Reducing risk by preventing imbalances of supply and demand, including developing financial derivatives, insurance, and futures markets

Private B2B networks serve different goals than B2B e-commerce marketplaces. B2B e-commerce marketplaces are primarily transaction-oriented, whereas private B2B networks focus on continuous business process coordination among companies. This can include much more than just supply chain management, such as product design, sourcing, demand forecasting, asset management, sales, and marketing. Private B2B networks do support transactions, but that is not their primary focus.

Private B2B networks usually focus on a single sponsoring company that "owns" the network, sets the rules, establishes governance (a structure of authority, rule enforcement, and control), and invites firms to participate at its sole discretion. Therefore, these networks are private. This sets them apart from industry consortia, which are usually owned by major firms collectively through equity participation. Whereas B2B e-commerce marketplaces have a strong focus on indirect goods and services, private B2B networks focus on strategic, direct goods and services.

For instance, True Value supplies 90,000 different products to more than 4,000 independent hardware stores generating more than $10 billion in revenue in the United

States and around the world. The logistics are staggering to consider. They import roughly 3,500 containers through 20 international ports and 10 domestic ports a year and routinely process more than 60,000 domestic inbound loads. The existing inbound supply chain system was fragmented, did not permit real-time tracking of packages, and, when shipments were short or damaged, could not alert stores. The supply chain was "invisible": Suppliers could not see store inventory levels, and stores could not see supplier shipments. Using an online solution from Sterling Commerce (an IBM company), True Value created its own private B2B network to which all suppliers, shippers, and stores have exclusive access. The network focuses on three processes: domestic prepaid shipping, domestic collect, and international direct shipping. For each process, the network tracks in real time the movement of goods from suppliers to shippers, warehouses, and stores. The system has led to a 57% reduction in lead time needed for orders, a 10% increase in the fill rate of orders, and an 85% reduction in back orders. If goods are delayed, damaged, or unavailable, the system alerts all parties automatically. In 2019, it added new software from JDA Software to improve how it manages inventory and forecasts demand (True Value Company, 2022; U.S. Department of Transportation, 2022; Smith, 2019; Amato, 2018).

PRIVATE B2B NETWORKS AND COLLABORATIVE COMMERCE

Private B2B networks can do much more than just serve a supply chain and efficient customer response system. They can also include other activities of a single large manufacturing firm, such as design of products and engineering diagrams, as well as marketing plans and demand forecasting. Collaboration among businesses can take many forms and involve a wide range of activities—from simple supply chain management to coordinating market feedback to designers at supply firms (see **Figure 12.15**).

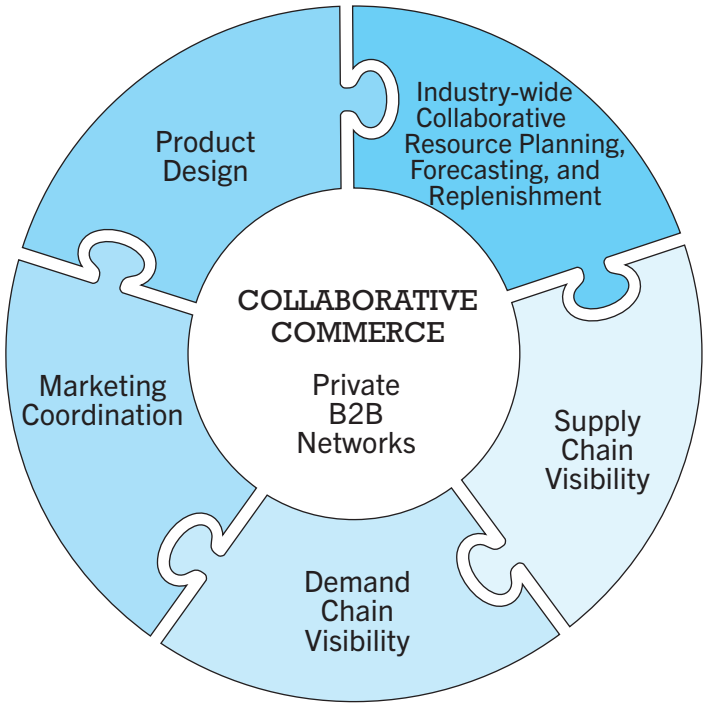
One form of collaboration—and perhaps the most profound—is industry-wide **collaborative resource planning, forecasting, and replenishment (CPFR)**, which involves working with network members to forecast demand, develop production plans, and coordinate shipping, warehousing, and stocking activities to ensure that retail and wholesale shelf space is replenished with just the right amount of goods. If this goal is achieved, hundreds of millions of dollars of excess inventory and capacity could be wrung out of an industry. This activity alone is likely to produce the largest benefits and justify the cost of developing private B2B networks.

collaborative resource planning, forecasting, and replenishment (CPFR) involves working with network members to forecast demand, develop production plans, and coordinate shipping, warehousing, and stocking activities to ensure that retail and wholesale shelf space is replenished with just the right amount of goods

A second area of collaboration is *demand chain visibility*. In the past, it was impossible to know where excess capacity or supplies existed in the supply and distribution chains. For instance, retailers might have significantly overstocked shelves, but suppliers and manufacturers—not knowing this—might be building excess capacity or supplies for even more production. These excess inventories would raise costs for the entire industry and create extraordinary pressures to discount merchandise, reducing profits for everyone.

A third area of collaboration is *marketing coordination and product design*. Manufacturers that use or produce highly engineered parts use private B2B networks to coordinate both their internal design and marketing activities, as well as related activities of their supply and distribution chain partners. By involving their suppliers in product design and marketing initiatives, manufacturing firms can ensure that the parts produced actually fulfill the claims of marketers. On the reverse flow, feedback from customers can be used by marketers to speak directly to product designers at the firm

FIGURE 12.15 PIECES OF THE COLLABORATIVE COMMERCE PUZZLE



Collaborative commerce involves many cooperative activities among supply and sales firms closely interacting with a single large firm through a private B2B network.

and its suppliers. For the first time, closed loop marketing (customer feedback directly impacting design and production) can become a reality.

Perhaps no single firm better illustrates the benefits of developing private B2B networks than Walmart, described in *Insight on Business: Walmart's Private B2B Network Supports Omnichannel Growth*.

IMPLEMENTATION BARRIERS

Although private B2B networks represent a large part of the future of B2B, there are many barriers to their complete implementation. Participating firms are required to share sensitive data with their business partners, up and down the supply chain. What in the past was considered proprietary and secret must now be shared. In a digital environment, it can be difficult to control the limits of information sharing. Information a firm freely gives to its largest customer may end up being shared with its closest competitor.

Integrating private B2B networks into existing enterprise systems and EDI networks poses a significant investment of time and money. The leading providers of enterprise systems to Fortune 500 companies (Oracle, IBM, and SAP) do offer B2B modules and supply chain management capabilities that can be added to their existing software suites. Nevertheless, implementing these modules is a very expensive proposition in part because the procurement side of many Fortune 500 firms is so fragmented and out-of-date.

INSIGHT ON BUSINESS

WALMART'S PRIVATE B2B NETWORK SUPPORTS OMNICHANNEL GROWTH

Walmart is a leader in using information technology to coordinate its supply chain. Walmart's private B2B network is the secret sauce behind its claim of offering the lowest everyday prices. Walmart can make this promise because it has one of the most efficient supply chains in the world. Walmart's private B2B network enables its vast network of suppliers, warehouses, and retail stores to act more like a single firm than a disparate collection of separate companies, decreasing expenditures on merchandising, inventory, logistics, and transportation for all participants in the supply chain, not just for Walmart.

With revenue of about $575 billion in 2021, Walmart has been able to use information technology to achieve a decisive cost advantage over competitors. The world's largest retailer also has the world's largest supply chain, with more than 100,000 suppliers worldwide. In the United States, Walmart has more than 5,350 retail stores (including Sam's Clubs). The larger stores stock as many as 200,000 different items. Internationally, Walmart has more than 5,100 additional stores in 24 countries, giving it a total of around 10,500. Worldwide, Walmart employs 3.2 million people, more than any other private firm in the world.

In the late 1980s, Walmart developed the beginnings of collaborative commerce using an EDI-based system that required its large suppliers to use Walmart's proprietary EDI network to respond to orders from Walmart purchasing managers. In 1991, Walmart expanded the system's capabilities by introducing Retail Link. Retail Link connected Walmart's largest suppliers to Walmart's own inventory management system and required large suppliers to track actual sales by stores and replenish supplies as dictated by demand and following rules imposed by Walmart.

In 1997, Walmart moved Retail Link to an extranet that allowed suppliers to directly link over the Internet into Walmart's inventory management system. In 2000, Walmart upgraded Retail Link to become a more collaborative forecasting, planning, and replenishment (CFPR) system. Walmart purchasing agents were now able to aggregate demand from all of Walmart's separate stores in the United States into a single RFQ from suppliers. This gave Walmart tremendous clout with even the largest suppliers. The software helped Walmart purchasing agents select a winning bid and negotiate final contracts. In addition, the software enabled suppliers to immediately access information on inventories, purchase orders, invoice status, and sales forecasts, with data available by item, by store, and by hour. In 2002, Walmart switched to an entirely Internet-based version of EDI, and the result was a radical reduction in communications costs.

However, despite its success in building a world-class supply chain to support its retail stores, Walmart initially was not well prepared to deal with online sales. It separated out its e-commerce operation as a separate company with a lower priority for investment than its physical stores. It was late to invest in an Internet logistics and supply chain system and instead relied on employees at some of the stores to pick online orders and ship from the store, while other orders were handled by a few Internet order warehouses.

Beginning in 2012, Walmart began a transition to a new supply and inventory management platform called Retail Link 2.0 and a new Global Replenishment System (GRS). Both are an integral part of Walmart's omnichannel strategy, which is to expand the reach of Walmart.com by using its retail stores and warehouses for online order fulfillment

(continued)

(continued)

and in-store purchases. The result is an integrated platform for selling its products to both online and in-store customers and making sure it has enough inventory at the right price on hand to make the sale in both environments. This has turned out to be a more difficult task than anticipated.

In the online environment, prices need to change in real time, and vendors need to respond in real time. For instance, Amazon makes more than 2.5 million pricing changes each day. Walmart needed to match that functionality in order to compete. Retail Link 2.0 (a real-time, online data and forecasting system) enables Walmart to capture point-of-sale data from local stores and make that data available to vendors within minutes, compared to days with the old system. The system is integrated with social media and Walmart.com so that vendors can track consumer sentiment and brand mentions and provides vendors access to demographic data and weather information, which enables vendors to make micro-adjustments to their production.

The Global Replenishment System (GRS) is an online analytics package that allows vendors and Walmart to forecast future near-term sales and ensure that inventory is available in stores and warehouses to sell to customers, whether they are online or at a store. GRS is predictive, not just reflective, of past sales. GRS is a just-in-time inventory management system. Vendors no longer need to download data and put it into a spreadsheet to make their own decisions about order sizes. GRS uses predictive algorithms to forecast what sales will most likely be in the next few days or weeks based in part on past patterns.

Despite these technological advances, Walmart initially ran into serious inventory problems. Empty shelves and delayed online fulfillment were in part caused by vendors not delivering on-time, complete orders. To deal with this issue, Walmart began its "On Time, in Full" (OTIF) program, which fines vendors for not delivering complete orders on time. In 2018, in its continuing effort to better compete with Amazon, Walmart began using Microsoft's Azure cloud computing platform, as well as Microsoft's machine learning, artificial intelligence, and other services to look for new ways to leverage Walmart's customer and product data. The effort reportedly included plans to jointly work on a new system to share product sales data with suppliers, a function currently handled by RetailLink. However, in 2022, Retail Link still remains an important part of Walmart's strategy, with Retail Link specialists at Walmart's headquarters deployed to help suppliers interpret the data it produces.

The Covid-19 pandemic significantly tested Walmart's supply chain, but Walmart was able to rise to the challenge. Although Walmart, like all retailers, had to grapple with out-of-stock items, it handled the disruption better than many of its competitors. Walmart continues to invest in its supply chain, spending billions on increased fulfilment capacity, supply chain automation, and technology in support of its omnichannel strategy. Walmart has solidified its position in the minds of consumers as a viable online option to Amazon, and analysts believe it is likely to be able to retain many of those new customers going forward.

SOURCES: "About," Corporate.walmart.com, accessed April 28, 2022; "Walmart Stock: Omnichannel Is a Solid Long-Term Growth Pillar," by Pearl Investing, Seekingalpha.com, March 6, 2022; "Walmart's Massive Investment in a Supply Chain Transformation," by Steve Banker, Forbes.com, April 23, 2021; "Walmart's Online Sales Surge during the Pandemic, Bolstering Its Place as a Strong No. 2 to Amazon," by Phil Wahba, Fortune.com, May 10, 2020; "Walmart's Planned Economy," by Leigh Phillips and Michal Rozworski, Mondediplo.com, March 2020; "Walmart Adjusts to Tariffs through a Price-Changing Tool for Suppliers," by Bloomberg, Mhlnews.com, June 17, 2019; "Amazon Foes Walmart and Microsoft Deepen Tech Partnership," by Jay Greene and Sarah Nassauer, *Wall Street Journal*, July 17, 2018; "Walmart Tightening Supplier Delivery Schedule," by Richard Turcsik, Supermarketnews.com, January 31, 2018; "Wal-Mart Will Punish Its Suppliers for Delivering Early," by Matthew Boyle, Bloomberg.com, July 12, 2017; "Walmart's Retail Link: An Invaluable Tool for Sellers," by Sharon Shichor, 18knowledge.com, February 10, 2017; "Supply Chain Analytics: Creating Value from Data with Machine Learning," by David Rimmer, Inboundlogistics.com, November 22, 2016; "Wal-Mart Curbs Inventory Growth," by Paul Page, *Wall Street Journal*, February 18, 2016; "Wal-Mart Builds Supply Chain to Meet E-commerce Demands," by Kim Nash, *Wall Street Journal*, May 7, 2015; "Walmart U.S. CEO: Fresher Food, Fill Empty Shelves and Lower Prices," by Phil Wahba, *Fortune*, April 2, 2015; "Wal-Mart Acknowledges Inventory Woes in U.S. Stores, Seeks 'Fresh' Fix," by Kim Souza, Thecitywire.com, February 12, 2015; "The Supply Side: Welcome to the Supply Chain Revolution," by Kim Souza, Thecitywire.com, February 2, 2015; "The Scoop on Retail Link 2.0," by Sheldon Cwinn, Linkedin.com, September 15, 2014; "Walmart's Secret Sauce: How the Largest Survives and Thrives," by Chris Petersen, Retailcustomerexperience.com, March 27, 2013.

For smaller firms, cloud computing and software as a service (SaaS) alternatives are appearing on the market, which offer far less-expensive supply chain management capabilities.

Adopting private B2B networks also requires a change in mindset and behavior for employees. Essentially, employees must shift their loyalties from the firm to the wider trans-organizational enterprise and recognize that their fate is intertwined with the fate of their suppliers and distributors. Suppliers in turn are required to change the way they manage and allocate their resources because their own production is tightly coupled with the demands of their private B2B partners. All participants in the supply and distribution chains, with the exception of the large network owner, lose some of their independence, and must initiate large behavioral change programs in order to participate (Laudon and Laudon, 2022).

12.6 CAREERS IN E-COMMERCE

Although B2C e-commerce attracts the most popular attention, it is dwarfed in both dollar volume and importance to the U.S. economy by B2B e-commerce. This chapter provides foundational information for a number of different careers involved with B2B e-commerce. Job titles include positions involving the supply chain, procurement/purchasing/sourcing, demand planning, materials, logistics, as well as B2B marketing.

THE COMPANY

The company is a leading U.S. manufacturer and wholesale distributor of musical instruments, amplifiers, speakers, and accessories. The firm supplies more than 20,000 products to 6,000 dealers located throughout the United States and Europe. The company does not sell to retail customers; it sells wholesale only to music stores, big box national retail chains, and online retailers.

POSITION: JUNIOR SUPPLY CHAIN ANALYST

The company is seeking a Junior Supply Chain Analyst who will be responsible for planning and managing production schedules to meet customer delivery requirements and to best utilize the company's productive capacity, as well as managing raw material and finished goods. The company is in the process of transitioning from a legacy SCM system to a cloud-based SCM system. Specific responsibilities include:

- Analyzing inventory and purchasing additional materials.
- Creating, maintaining, and processing purchase orders.
- Reconciliating accounts and processing of invoicing.
- Facilitating return shipments and credit payments with national accounts.
- Communicating with national accounts to validate suggested order quantities and pricing.
- Compiling reports within Excel.
- Creating promotional and seasonal plans to maximize sales and increase Average Order Value (AOV).
- Implementing and managing mail-in rebates, instant rebates, and promotions.
- Utilizing reports and analytical tools and updating required databases on an as-needed basis.

QUALIFICATIONS/SKILLS

- Bachelor's degree or equivalent work experience required (concentration in Management Information Systems, Business, E-commerce, Accounting, Economics, Purchasing, or Supply Chain is preferred)
- Analytical skills and attention to detail
- Ability to understand and analyze complex data in order to make informed decisions
- A sharp mind with an ability to grasp concepts quickly and work out solutions to complex logic problems
- Experience in MS Office Suite, especially Excel is preferred
- Excellent communication skills, both verbal and written
- Positive attitude, strong work ethic, and ability to multitask is a must
- Ability to work well under the stress of deadline pressure

HOW TO PREPARE FOR THE INTERVIEW

To prepare for this interview, make sure that you are familiar with the basic vocabulary of B2B e-commerce covered in Section 12.1 as well as have an understanding of the evolution of various technology platforms used in B2B e-commerce (Figure 12.1). Next, drill-down and focus on the material in Section 12.2 that covers the procurement process and supply chain. Make sure that you can talk about the various steps in the procurement process (Figure 12.4) and the different types of procurement. Be ready to show that you are knowledgeable about some of the basic concepts, challenges, and trends of supply chain management, such as supply chain visibility, just-in-time and lean production, supply chain management, adaptive supply chains, accountable supply chains, and sustainable supply chains, covered in Section 12.3. Because the company is in the process of transitioning to a cloud-based SCM system, also review the section of the text entitled "B2B in the Cloud." The case study on Elemica, although a very different industry, can also provide some potentially useful parallels that you could discuss, as it focuses on cloud-based order management and supply chain applications and services. Finally, because the position also involves a purchasing component, it would be useful to understand the different types of marketplaces in which such purchases could be made, such as from e-distributors, e-procurement companies, and exchanges, covered in Section 12.4.

POSSIBLE FIRST INTERVIEW QUESTIONS

1. Have you had any experience in purchasing supplies from vendors and managing purchase orders? Can you give an example? What were some of the challenges you faced dealing with vendors, and how did you solve them?

If you have any kind of business or volunteer experience ordering supplies, keeping track of supply inventory, invoicing, and payment tracking, then describe what you did, and talk about the challenges you faced such as vetting the supplier's credit, pricing, purchase order tracking, and delivery issues. Otherwise, do Internet research to obtain a basic understanding of vendor relations and purchase order management.

2. A key to our success is matching the stream of orders to our production and purchasing schedules. We try to avoid excess inventory of parts, and yet we need to have enough parts on hand to fulfill orders. We need to link the demand for our products to the purchasing of parts and supplies. Do you have any ideas on how we can match our purchasing of supplies to the stream of incoming orders?

You can suggest here that most supply chain management systems are linked to the order entry system. Based on incoming orders, SCMs will produce data that is fed into the production system, which, in turn, results in a list of parts needed and schedule requirements. Because this position is closely linked to SCM, you should do research on SCM systems to understand their functionality.

3. We'd like to use social media as a way to enhance communications with our suppliers. Do you have any suggestions about how we might build a social network to support our supply chain?

Here you can talk about your experience with LinkedIn, Facebook and Twitter, especially about how business firms can use these platforms to build a social community of vendors and manufacturers. The process of building a social network for vendors is very similar to building a social network of customers. Use of video, blogs, comments, newsfeeds, and posts can be very valuable in creating a community of vendors.

4. We are trying to reduce costs of our supplies by participating in a number of B2B e-commerce marketplaces where vendors compete with one another on price and quality to become one of our suppliers. What do you know about B2B e-commerce marketplaces and how they might be helpful for us?

You might point out here the different kinds of B2B e-commerce marketplaces. The firm should use e-distributors, such as Amazon Business or eBay Business, to obtain the lowest cost for indirect supplies. The firm could also participate in an e-procurement network such as SAP Ariba to obtain competitive quotations for supplies and direct inputs.

6. We are trying to integrate our vendors more closely into our business planning and even the design of new products. We're looking for a collaborative effort from our suppliers and greater visibility into our supply chain both for our purposes and our vendors' purposes. What do you know about collaborative commerce? What have you learned about supply chain visibility?

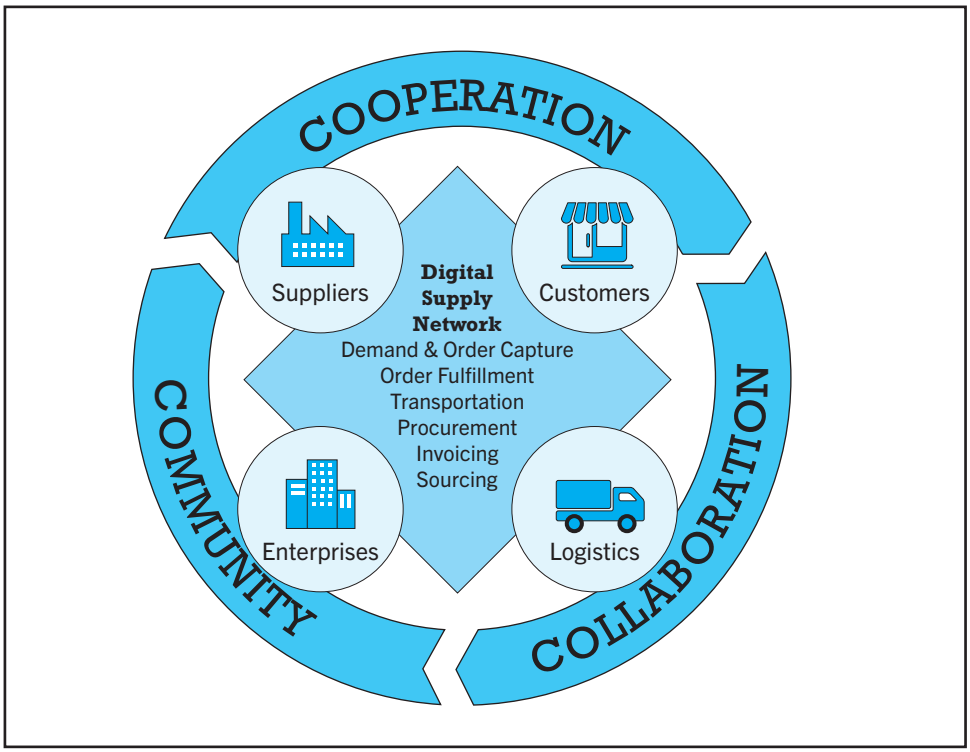
You could refer to private B2B networks composed of a single manufacturing firm that owns the network and the group of suppliers that work with the manufacturer to design and build component parts, similar to that created by Procter & Gamble. In this kind of collaborative effort, both the vendors and the ultimate buyer of components work together to create and design inputs, and both benefit from the results.

12.7 CASE STUDY

Elemica:
Cooperation, Collaboration, and Community

Elemica is a B2B cloud-based, digital supply chain platform aiming to revolutionize the entire supply chain of the chemical, plastics, rubber, energy, pharmaceuticals, food and beverage, and other process manufacturing industries worldwide. Its mission is not just to foster cooperation on a one-to-one, inter-firm basis or collaboration on multi-firm projects, but instead to lift all boats on an industry tide by providing an inter-firm platform for communicating B2B information, and thereby making all firms more efficient.

Elemica today processes more than $1 trillion in annual transactions across more than 7,500 process manufacturing industry trading partners; 16,000 network participants around the world, including more than 100 of the largest global process manufacturers; thousands of their direct material suppliers; more than 500 logistics service



suppliers; as well as thousands of end customers. Clients include AkzoNobel, BASF, Bayer, BP, Campbell's, Continental, Dow, DuPont, ExxonMobil, Goodyear, Levi's, Pepsico, Pirelli, and Westinghouse.

Elemica was an early example of a B2B e-commerce industry consortium. In the late 1990s, senior leaders at some of the larger chemical companies began to focus on changes in technology that made the adoption of information technology and the tools of e-commerce more appealing. The questions were how to best use these advances to benefit their businesses and how to establish industry standards for electronic transactions to make them accessible and attainable for all.

Unlike the automobile industry or the airline industry, where a few companies dominate, the global chemical industry is made up of many companies of all sizes. In addition, unlike many other industries, chemical companies often buy the output from other chemical companies to use as raw materials for their products. Thus, chemical companies are often customers of one another as well as competitors.

Leaders from companies such as Dow and DuPont determined that a cooperative alliance would be the most efficient way to move forward. They were met with initial skepticism by marketing and sales staff, who worried that online procurement would negatively affect relationships. Senior corporate leadership wasn't sure that e-commerce would be useful for the chemical industry. And companies were cautious about the expense of investing in the infrastructure necessary for e-commerce.

However, there were compelling opportunities that were impossible to dismiss, including lowering costs, creating closer connections with customers and suppliers, and differentiating companies on something other than price. At the same time, new startups were making traditional chemical companies nervous. What would happen if their efforts to use information technology to streamline an inefficient supply chain helped them capture market share? In other words, if the more traditional companies didn't move forward, they might end up losing the revenue race.

When Dow began looking at startups that were using e-commerce and talking to their customers, they found that customers were concerned about making an investment to establish online connections with multiple firms. Dow and DuPont decided that the best and most economically efficient option was to offer customers the choice of a neutral one-to-one link. This would remove the obstacle of multiple connections. A strong, third-party network addressed the community concern about loss of control. The two companies decided to create and invest in a neutral e-commerce company, partnering with other companies to create the critical mass needed to make it viable. All participants shared the common goal of creating a neutral platform to facilitate inter-company transactions and enhance business processes. Ultimately, 22 leading companies in the chemical industry (including oil and natural gases) were involved in the launch of Elemica in 2000. In succeeding years, Elemica has expanded far beyond chemicals to encompass other major process manufacturing industries.

How does Elemica achieve community among a diverse, global collection of firms where firms are often both customers of and vendors to one another? It unites community members by linking together their enterprise systems. This is the "social glue" that sets Elemica apart. This "super platform" permits companies to communicate with one another and to conduct transactions, handle logistics, and keep the books. The Elemica commerce platform has effectively standardized industry business transactions for all

network members regardless of the type of enterprise system they have, and it has leveled the playing field for trade partners who are less technically sophisticated. This neutral platform facilitates millions of transactions for industry suppliers, customers, and third-party providers. In this sense, Elemica is one of the most sophisticated technology platforms in the B2B space.

One of the largest investments for a company is its enterprise system. Despite these investments, intercompany relationships—the backbone of its supply chain—are often left to outdated and unreliable processes. These shortcomings cost billions in lost productivity, revenue, and profit. Elemica's platform changes that. It helps its clients leverage their enterprise system investment by incorporating transactions to external trade partners. Elemica enables companies to link their internal IT systems through a neutral platform so that information is moved into each company's database while maintaining confidentiality and security. The chemical and oil industries were among the first users of enterprise systems (referred to in the early years as manufacturing resource planning systems). These large-scale systems were developed by single firms in order to rationalize and control the manufacturing process. They achieved this objective by identifying the outputs, inputs, and processes involved in manufacturing and automating key elements including inventory control and planning, process control, warehousing and storage, and shipping/logistics. If a company needed to produce 10 tons of polyethylene plastic, its enterprise system could tell it precisely how many tons of petrochemical inputs were required, when they should be delivered to manufacturing, the machinery and labor force required to manufacture the product, how long it would take, where it would be stored, and sometimes how it would be shipped. The systems can estimate the cost at any stage.

Elemica facilitates transactions of all types including order processing and billing, and logistics management. However, unlike some other companies in the field, Elemica does not buy, sell, or own raw material products. Instead, it acts as an intermediary, or network, linking companies together to automate confidential transactions. Like eBay or a credit card company, Elemica's revenue comes from charging transaction fees on a per-transaction basis. Its network of clients opens the door for companies to do business with all other connected buyers and sellers.

Elemica offers a variety of services for suppliers, customers, and logistic partners, enabling them to automate both their business processes and their internal purchasing. A modular, cloud-based solution simplifies sales, procurement, and financial processes; integrates supply chain partners to diminish communication barriers; and reduces overhead and errors.

Elemica integrates information flow among global trading partners using a cloud-based business process network. This is often referred to as platform as a service (PaaS). Each client needs only a single connection to Elemica, and Elemica manages the connections to that company's external trade partners. That means a company needs to maintain only one connection to Elemica (important when it's time for enterprise system maintenance or upgrade) rather than to maintain a variable number of connections and infrastructure to all its trade partners. Once a company connects to Elemica, it can have access to thousands of other trading partners, including suppliers, customers, and logistics firms. Clients are charged for the service based on volume of usage. This is much more efficient than older EDI solutions to inter-company transactions. Elemica

provides the platform for collaborative commerce through a fully automated, integrated network of suppliers, customers, and third-party providers.

Elemica offers cloud-based solutions for five primary areas, which it characterizes as Buy (supplier management), Move (logistics management), Sell (customer management), Assure (quality management, traceability, and regulatory compliance), and See (analytics). Using a variety of solutions within these areas, companies can automate ordering, invoicing, shipment tracking, and day-to-day business operations. Companies can sign up for one or more solutions depending on their needs. The software applications are software as a service (SaaS) applications residing on Elemica cloud servers and, therefore, do not require participating firms to buy any hardware or software. Firms are charged on the basis of how much of the service they use, on a demand basis.

Here's an example of how Elemica works. Let's say you need to order vinyl acetate from one of your suppliers. You put the order into your internal enterprise system, the order is automatically routed to Elemica's network, Elemica routes the order to your supplier's internal enterprise system, and you get a confirmed receipt of the order. Elemica's network ensures the accuracy of the item number and purchase order number and sends an alert if there's an issue. Once an order is confirmed, Elemica's platform can be leveraged to plan and coordinate delivery and automatically send an invoice and submit payment. For small or medium firms that may not have an enterprise system, Elemica has an online portal with online software that allows firms to participate in the community with suppliers and customers. The platform offers a closed-loop process, end to end, from the purchase order to acknowledgments, load tenders and responses, carrier status updates, and dock scheduling. All of this takes place in a few seconds with little or no human intervention. The customer can send the purchase order via e-mail or e-fax, which is then routed to Elemica. Elemica then routes it to the supplier in its preferred format, integrated with its enterprise system as though it were a true electronic order. This holistic approach to order management allows suppliers to automate the process with both strategic and core customers, without asking their customers to change their processes. It's a win-win situation for suppliers and customers. Elemica's platform is sometimes referred to as a "Come as You Are" network because it allows firms to use whatever communication tools they currently use, such as EDI, XML, and even e-mail, or formats associated with their enterprise systems.

Elemica's business model has been successful primarily because it addresses the needs of process manufacturing industry companies of all sizes. It does this by offering multiple options for connecting to its platform and multiple products that can be used alone or in combination, and by ensuring that only one connection integrated with a client's enterprise system is needed for all transactions. Customers can use Elemica, and take advantage of the technology it offers, without purchasing an additional internal system.

With Elemica, companies benefit from improved operational efficiency, reduced costs due to elimination of redundant systems and excess inventory, and a much higher

SOURCES: Elemica.com, accessed April 28,2022; "Elemica Acquires OmPrompt, Strengthens Industry-Leading Supply Chain Automation Solution," Elemica.com, March 8, 2021; "Elemica Acquires ProcessWeaver, Integrates Parcel TMS," Elemica.com, December 16, 2020; "Elemica Wins Food Logistics Green Supply Chain Award," Elemica.com, July 2, 2020; "Elemica Expands Logistics Footprint with Acquisition of Eyefreight Transportation Management," Globenewswire.com, January 30, 2020; "Elemica Celebrates Its 20th Anniversary as

a Supply Chain Network Pioneer," by Elemica, Globenewswire.com, January 22, 2020; "Elemica Acquires EMNS, a Leading Quality Compliance Provider, Elemica.com, March 8, 2019; "Optimising the Supply Chain: The Visible Effect of Elemica's Digital Supply Network," Europeanbusinessreview.com, January 22, 2019; "Elemica Wins 2019 Supply & Demand Chain Executive Green Supply Chain Award," by Elemica, Globenewswire.com, December 11, 2019; "Elemica Closes on Eurazeo Partnership," by Elemica, Globenewswire.com, September 19, 2019; "Creating a True Digital Procurement Supply Chain," by Patrick Burnson, Supplychain247.com, May 15, 2018; "Thoma Bravo Completes Acquisition of Elemica," Elemica, July 7, 2016;"Building Effective Business Networks in Process Industries Improving Supply Chain Value Networks," by Lora Cecere, Supply Chain Insights, LLC, January 2015; "Elemica: Shifting from a Shared Services Bazaar to Platform 'PaaS' Standard," by Jason Busch, Spendmatters.com, November 18, 2013; "Next Generation Supply Chain Networks Enable More Robust Collaborative Workflows across Trading Partners to Increase Value," Becky Boyd, Market Wired, July 2, 2013; "Case Study: Elemica," Ebusinesswatch.org, August 25, 2009; "Once Elemica Tackled the Hard Part, the Rest Was Easy," SupplyChainBrain.com, August 5, 2009.

percentage of safe and reliable deliveries. The flexibility of Elemica's solutions and network combines simplification, standardization, and efficiency. And clients have increased their profitability and improved cash flow through faster payment.

A number of very large companies use Elemica's platform. For instance, Swiss-based Barry Callebaut, the world's leading premier chocolate manufacturer, with annual sales of almost $8 billion, implemented Elemica's order automation solution to help it deal with manual order entries. Only a small percentage of Barry Callebaut's orders are being processed automatically via a customer portal or EDI. For the rest, transaction data is embedded in customer e-mails or digital documents. Elemica's solution will extract that data directly from those e-mails and documents.

Through the years, Elemica has continued to innovate, developing new products to address new chains in supply chain management, including supply chain visibility, supply chain risk management, supply chain sustainability, and social collaboration tools. It has also acquired a number of companies, such as Eyefreight, a SaaS transportation management solutions provider, to expand Elemica's global end-to-end supply chain network into the logistics market; OmPrompt, which had developed proprietary algorithms, machine learning, artificial intelligence and other tools to help consumer packaged goods, food and beverage, and pharmaceutical businesses automate their supply chain management; ProcessWeaver, a multi-carrier shipping solutions provider that automates the execution of processes required to pick and pack and ship high volumes of small-parcel and less-than-full truckload shipments; and EMNS, a material quality compliance company.

Elemica has also developed a sustainability program. In 2020, it received its sixth consecutive Green Supply Chain award for the food logistics industry. It has also received the SDCE Green Supply Chain award for multiple years, recognizing its efforts in promoting sustainable supply chains.

In 2019, Eurazeo Capital, a leading global investment company, acquired Elemica from Thomas Brava, a private equity firm that had previously purchased Elemica in 2016. Eurazeo is providing support for Elemica's expansion into new industry verticals, geographics, and products.

Case Study Questions

1. If you were a small chemical company, what concerns would you have about joining Elemica?
2. Elemica provides a community for participants where they can transact, coordinate, and cooperate to produce products for less. Yet these firms also compete with one another when they sell their products to end-user firms. How is this possible?
3. How did the purchase of Elemica by first Thoma Bravo and then Eurazeo Capital change how Elemica fits into the B2B framework illustrated in Figure 12.9?

12.8 REVIEW

KEY CONCEPTS

■ Discuss the evolution and growth of B2B e-commerce, as well as its potential benefits and challenges.

- Before the Internet, business-to-business transactions were referred to simply as *inter-firm trade* or the *procurement process*. Today, we use the term *B2B commerce* to describe all types of inter-firm trade to exchange value across organizational boundaries, involving both the buying of inputs and the distribution of products and services, and the term *B2B e-commerce* to describe specifically that portion of B2B commerce that is enabled by the Internet and mobile apps.
- In order to understand the evolution of B2B e-commerce, you must understand several key stages:
  - *Automated order entry systems,* developed in the 1970s, involved the use of telephone modems to send digital orders.
  - *EDI* or *electronic data interchange,* developed in the late 1970s, is a communications standard for sharing various procurement documents including invoices, purchase orders, shipping bills, product stocking numbers (SKUs), and settlement information for an industry. EDI remains very important in B2B e-commerce.
  - *B2B e-commerce websites* emerged in the 1990s along with the commercialization of the Internet. They are online catalogs containing the products that are made available to the general public by a single vendor.
  - *B2B e-commerce marketplaces* (Net marketplaces) emerged in the late 1990s as a natural extension and scaling-up of the electronic storefront. B2B e-commerce marketplaces involve the marketing, selling, and distribution side of B2B e-commerce. The essential characteristic of all B2B e-commerce marketplaces is that they bring hundreds of suppliers, each with its own online catalog, together with potentially thousands of purchasing firms to form a single Internet-based marketplace.
  - *Private B2B networks* (private industrial networks) also emerged in the late 1990s with the commercialization of the Internet as a natural extension of EDI systems and the existing close relationships that developed between large industrial firms and their suppliers.
- Potential benefits of B2B e-commerce include lower administrative costs, lower search costs for buyers, reduced inventory costs, lower transaction costs, improved quality of products, decreased product cycle time, increased opportunities for collaborating with suppliers and distributors, greater price transparency, and increased visibility and real-time information sharing among all participants in the supply chain network.
- Potential risks and challenges include lack of real-time data, environmental impacts, natural disasters, labor concerns, and the impacts of economic, financial, and political instability.

■ Understand how procurement and supply chains relate to B2B e-commerce.

- The *procurement process* refers to the way business firms purchase the goods they need in order to produce the goods they will ultimately sell to consumers. Firms purchase goods from a set of suppliers who in turn purchase their inputs from their own set of suppliers. These firms are linked in a series of connected transactions. The *supply chain* is the series of transactions that links sets of firms that do business with each other. It includes not only the firms themselves but also the relationships among them and the processes that connect them.
- There are two different types of procurements (purchases of direct goods and purchases of indirect goods) and two different methods of purchasing goods (contract purchases and spot purchases).
- The term *multi-tier supply chain* is used to describe the complex series of transactions that exists among a single firm with multiple primary suppliers, the secondary suppliers who do business with those primary suppliers, and the tertiary suppliers who do business with the secondary suppliers.

■ Identify major trends in supply chain management and collaborative commerce.

- *Supply chain management (SCM)* refers to a wide variety of activities that firms and industries use to coordinate the key players in their procurement process.
- *Supply chain simplification* involves reducing the size of the supply chain and working more closely with a smaller group of strategic supplier firms to reduce both product costs and administrative costs while improving quality.
- *Just-in-time production* is a method of inventory cost management that seeks to eliminate excess inventory to a bare minimum.
- *Lean production* is a set of production methods and tools that focuses on the elimination of waste throughout the customer value chain.
- *Adaptive supply chains* allow companies to react to disruptions in the supply chain in a particular region by moving production to a different region.
- *Accountable supply chains* are those where the labor conditions in low-wage, underdeveloped producer countries are visible and morally acceptable to the ultimate consumers in more developed industrial countries.
- *Sustainable supply chains* involve using the most efficient environment-regarding means of production, distribution, and logistics.
- *Mobile B2B* has become increasingly important in all aspects of B2B e-commerce, throughout all steps of the procurement process and throughout the supply chain.
- *Cloud-based B2B systems* shift much of the expense of B2B systems from the firm to a B2B network provider, sometimes called a data hub or B2B platform.
- Contemporary *supply chain management (SCM) systems* are based on supply chain simplification and just-in-time and lean production and focus on strategic partners in the production process, enterprise systems, and continuous inventory replenishment. They are increasingly using AI tools, such as digital twins.
- *Blockchain*, coupled with IoT, promises to bring about a transformation in supply chain management, eventually replacing legacy EDI technology.
- *Collaborative commerce* involves the use of digital technologies to permit firms to collaboratively design, develop, build, market, and manage products throughout their life cycles, and is a direct extension of supply chain management systems as well as supply chain simplification. Collaborative commerce today involves cloud servers, social business tools, and mobile devices.
- *Social networks* are providing intimate connections among customers, suppliers, and logistics partners.
- *B2B marketing* is increasingly becoming an important initiative in B2B e-commerce, although the total amount spent still accounts for only a relatively small slice of the total amount spent on digital marketing and advertising, in part due to the slow pace of technological change in supply chain and procurement management and in part due to the very different nature of B2B e-commerce compared to B2C e-commerce. For long-term sourcing, interpersonal relationships, networking, branding, and informative content marketing are the primary and most effective marketing tools. However, in spot purchasing markets, B2B marketing uses many of the same marketing tactics and tools found in B2C marketing: display ads, search engine marketing, websites, social network channels, videos, and mobile ads.

■ Understand the different characteristics and types of B2B e-commerce marketplaces.

- B2B e-commerce marketplaces are sell-side digital environments where sellers and buyers are brought together.
- Characteristics of B2B e-commerce marketplaces include their bias (seller-side vs. buy-side vs. neutral), ownership (industry vs. third party), pricing mechanism (fixed priced catalogs, auctions, and RFPs/RFQs), scope/focus (horizontal vs. vertical), value creation (customers/suppliers), and access to markets (public vs. private).

- There are four main types of B2B e-commerce marketplaces:
  - *E-distributors* are independently owned intermediaries that offer industrial customers a single source from which to make spot purchases of indirect or MRO goods. E-distributors operate in a horizontal market that serves many different industries with products from many different suppliers.
  - *E-procurement companies* are independently owned intermediaries that help businesses automate their procurement processes and in some instances provide a marketplace that connects suppliers to buyers who pay a fee to join the market. E-procurement marketplaces operate in a horizontal market in which long-term contractual purchasing agreements are used to buy indirect goods.
  - *Exchanges* are independently owned B2B e-commerce marketplaces that connect hundreds to thousands of suppliers and buyers in a dynamic real-time environment. They are typically vertical markets in which spot purchases can be made for direct inputs (both goods and services). Exchanges make money by charging a commission on each transaction.
  - *Industry consortia* are industry-owned vertical markets where long-term contractual purchases of direct inputs can be made from a limited set of invited participants. Consortia serve to reduce supply chain inefficiencies by unifying the supply chain for an industry through a common network and computing platform.

■ **Understand the objectives of private B2B networks, their role in supporting collaborative commerce, and the barriers to their implementation.**

- Objectives of private B2B networks include developing efficient purchasing and selling business processes industry-wide; developing industry-wide resource planning to supplement enterprise-wide resource planning; increasing supply chain visibility; achieving closer buyer-supplier relationships; operating on a global scale; and reducing industry risk by preventing imbalances of supply and demand.
- Private B2B networks are transforming the supply chain by focusing on continuous business process coordination between companies. This coordination includes much more than just transaction support and supply chain management. Product design, demand forecasting, asset management, and sales and marketing plans can all be coordinated among network members. Some of the forms of collaboration used by private B2B networks include the following:
  - *CPFR* or *industry-wide collaborative resource planning, forecasting, and replenishment* involves working with network members to forecast demand, develop production plans, and coordinate shipping, warehousing, and stocking activities.
  - *Supply chain and distribution chain visibility* refers to the fact that, in the past, it was impossible to know where excess capacity existed in a supply or distribution chain. Eliminating excess inventories by halting the production of overstocked goods can raise the profit margins for all network members because products will no longer need to be discounted in order to move them off the shelves.
  - *Marketing and product design collaboration* can be used to involve a firm's suppliers in product design and marketing activities as well as in the related activities of their supply and distribution chain partners. This can ensure that the parts used to build a product live up to the claims of the marketers. Collaborative commerce applications used in a private B2B network can also make possible closed-loop marketing in which customer feedback will directly impact product design.

QUESTIONS

1. Explain the differences between B2B commerce and B2B e-commerce.
2. What are the key attributes of a B2B e-commerce website? What early technologies are they descended from?
3. List at least five potential benefits of B2B e-commerce.
4. Name and define the two distinct types of procurements that firms make. Explain the difference between the two.

5. Name and define the two methods of purchasing goods.
6. Define the term supply chain, and explain what SCM systems attempt to do. What does supply chain simplification entail?
7. Explain the difference between a horizontal market and a vertical market.
8. How do the value chain management services provided by e-procurement companies benefit buyers? What services do they provide to suppliers?
9. What are the three dimensions that characterize an e-procurement marketplace based on its business functionality? Name two other market characteristics of an e-procurement marketplace.
10. Identify and briefly explain the anticompetitive possibilities inherent in B2B e-commerce marketplaces.
11. List three of the objectives of a private B2B network.
12. What is the main reason many of the independent exchanges developed in the early days of e-commerce failed?
13. Explain the difference between an industry consortium and a private B2B network.
14. What is CPFR, and what benefits could it achieve for the members of a private B2B network?
15. What are the barriers to the complete implementation of private B2B networks?
16. What is EDI, and why is it important?
17. Describe at least six major trends in supply chain management and collaboration.
18. Describe the challenges inherent to B2B e-commerce.
19. What is a multi-tier supply chain, and why does it pose a challenge for B2B e-commerce?
20. What is a cloud-based B2B platform, and what advantages does it offer?
21. Describe the differences and similarities between B2C and B2B marketing.

PROJECTS

1. Choose an industry and a B2B vertical market maker that interests you. Investigate the site and prepare a report that describes the size of the industry served, the type of B2B e-commerce marketplace provided, the benefits promised by the site for both suppliers and purchasers, and the history of the company. You might also investigate the bias (buyer vs. seller), ownership (suppliers, buyers, independents), pricing mechanism(s), scope and focus, and access (public vs. private) of the B2B e-commerce marketplace.

2. Examine the website of one of the e-distributors listed in Figure 12.9, and compare and contrast it to one of the websites listed for e-procurement marketplaces. If you were a business manager of a medium-sized firm, how would you decide where to purchase your indirect inputs—from an e-distributor or an e-procurement marketplace? Write a short report detailing your analysis.

3. Assume you are a procurement officer for an office furniture manufacturer of steel office equipment. You have a single factory located in the Midwest with 2,000 employees. You sell about 40% of your office furniture to retail-oriented catalog outlets such as Quill in response to specific customer orders, and the remainder of your output is sold to resellers under long-term contracts. You have a choice of purchasing raw steel inputs—mostly cold-rolled sheet steel—from an exchange and/or from an industry consortium. Which alternative would you choose and why? Prepare a presentation for management supporting your position.

4. You are involved in logistics management for your company, a national retailer of office furniture. In the last year, the company has experienced a number of disruptions in its supply chain as vendors failed to deliver products on time, and the business has lost customers as a result. Your firm has only a limited IT department, and you would like to propose a cloud-based solution. Research various supply chain management products, and write a report to senior management on why you believe that a cloud-based B2B solution is best for your firm.

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