Chapter 1

Overview of E-business

Learning Objectives

In this chapter, you will learn about:

- Definition of E-business
- The difference between E-commerce and E-business
- Types of E-business
- Applications of E-business
- Technologies used in E-business
- …

1. Concepts of E-business

Introduction

- In the past ten years, the Internet and World Wide Web have transformed how people communicate, conduct business, and go about their daily lives.
- The growth of the Internet and World Wide Web is the result of improvements in hardware and software.
- The Knowledge Age, or Digital Age, has recently started in our life.
- When discussing online business, the statements "Knowledge is power" and "Content is king" are frequently used.

Introduction (Cont.)

- Business transactions are now completed more quickly and easily thanks to E-business and E-commerce.
- Businesses must constantly adapt to new technologies, integrate quicker and more efficient systems, and satisfy the demands of customers worldwide.
- Products are now prepared specifically for customers rather than being kept in inventories to prepare for orders.
- It can be challenging to find and keep good staffs.

Introduction (Cont.)

- Now customers only need to travel a short distance to buy from other vendors, competing businesses must now work together if they want to survive.
- Web-enabled businesses still have an impact on people and businesses that are already established online and plan to conduct their works.
- It takes technical, marketing, and advertising expertise to set up and run an E-business, especially one that handles a lot of transactions.
- Due to ICT advancement, “E-service," “E-business," “E-commerce," “E-government“, and others have created.

What is E-business?

- Electronic business (e-business) can be defined as the use of the internet to network and business processes, electronic commerce, organizational communication and collaboration within a company and with its customers, suppliers, and other stakeholders.
- E-businesses utilize the internet, intranets, extranets and other networks to support their commercial processes.

The difference between E-commerce and E-business

E-commerce

- All electronically mediated information exchange between an organization and its external stakeholders.
- E-commerce is the buying and selling, marketing and servicing of products and services via computer networks.
- Digitally enabled commercial transactions between and among organizations and individuals.

The difference between E-commerce and E-business

E-business

- All electronically mediated information exchanges, both within an organization and with external stakeholders ***supported by the broader range of business processes***.
- Digital enabling of transactions and processes within a firm, involving information systems under the firm's control.
- Does not include commercial transactions involving an exchange of value across organizational boundaries.

The difference between E-commerce and E-business

E-commerce	E-business
Electronically mediated information exchange	
It occurs among organizations and external stakeholders.	It occurs both within an organization and external stakeholders supported by broader range of business processes.
Applied Digital	
It enables digital commerce among organizations and between businesses and individuals.	Firm-controlled information systems enable digital transactions and processes within a firm.
Others	
	Excludes cross-organizational commercial transactions.

Table 1.1: The difference between E-commerce and E-business. Source: Own processing.

Three definitions of the relationship between E-commerce and E-business

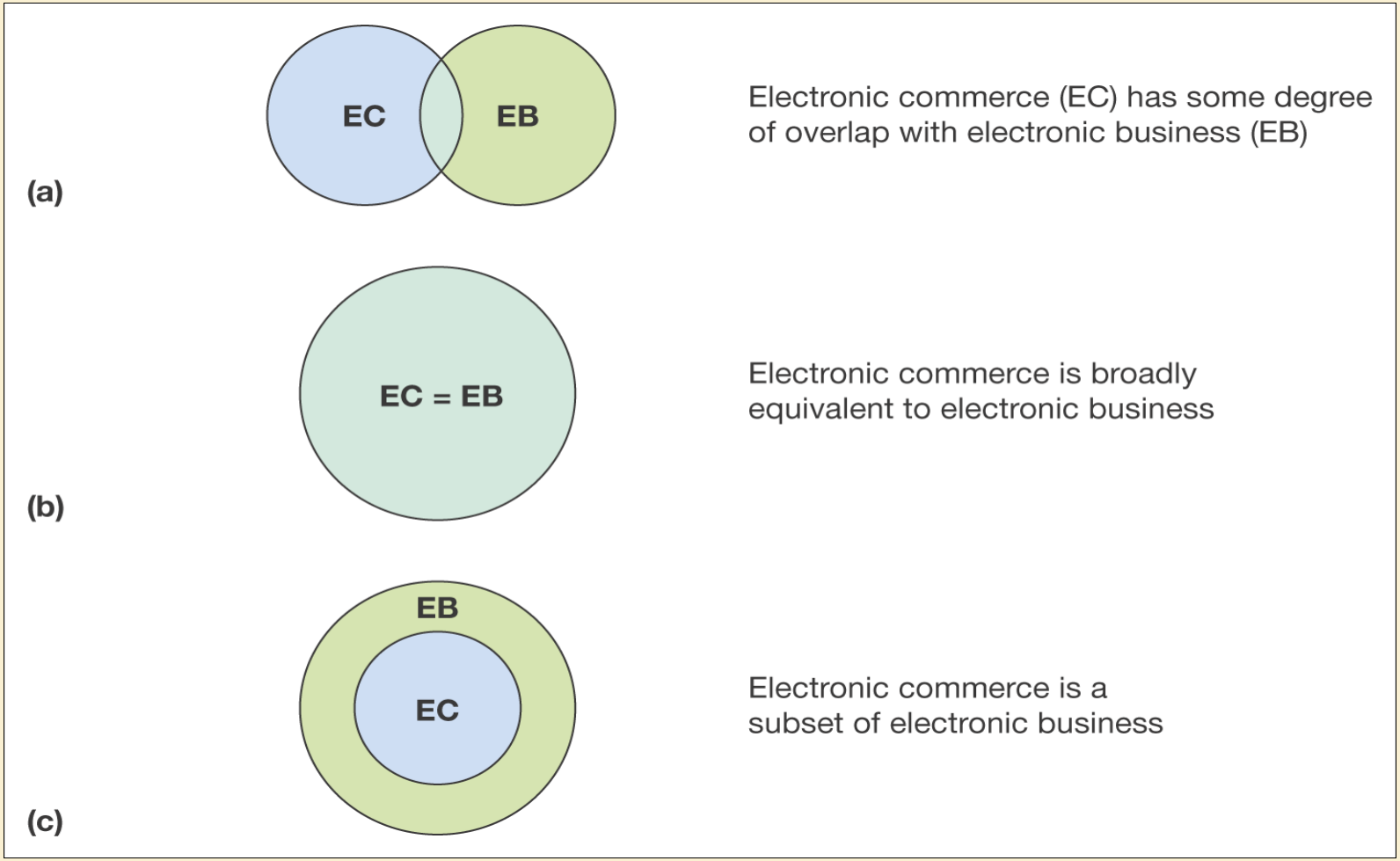


Figure 1.2: Three definitions of the relationship between e-commerce, e-business, and others.
Source: Own processing.

The distinction between buy-side and sell-side E-commerce

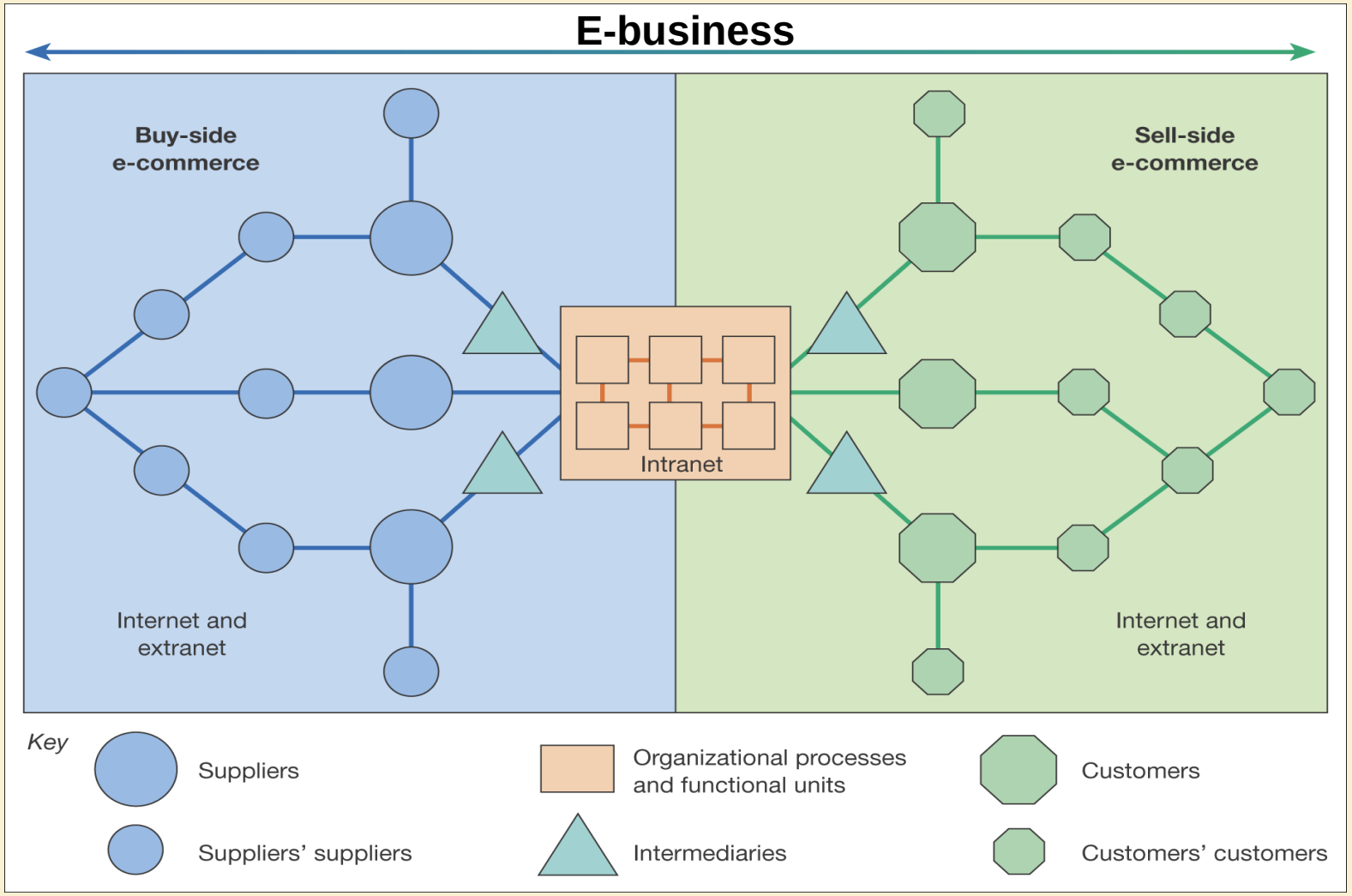


Figure 1.1: The distinction between buy-side and sell-side E-commerce.

The relationship between intranets, extranets and the Internet

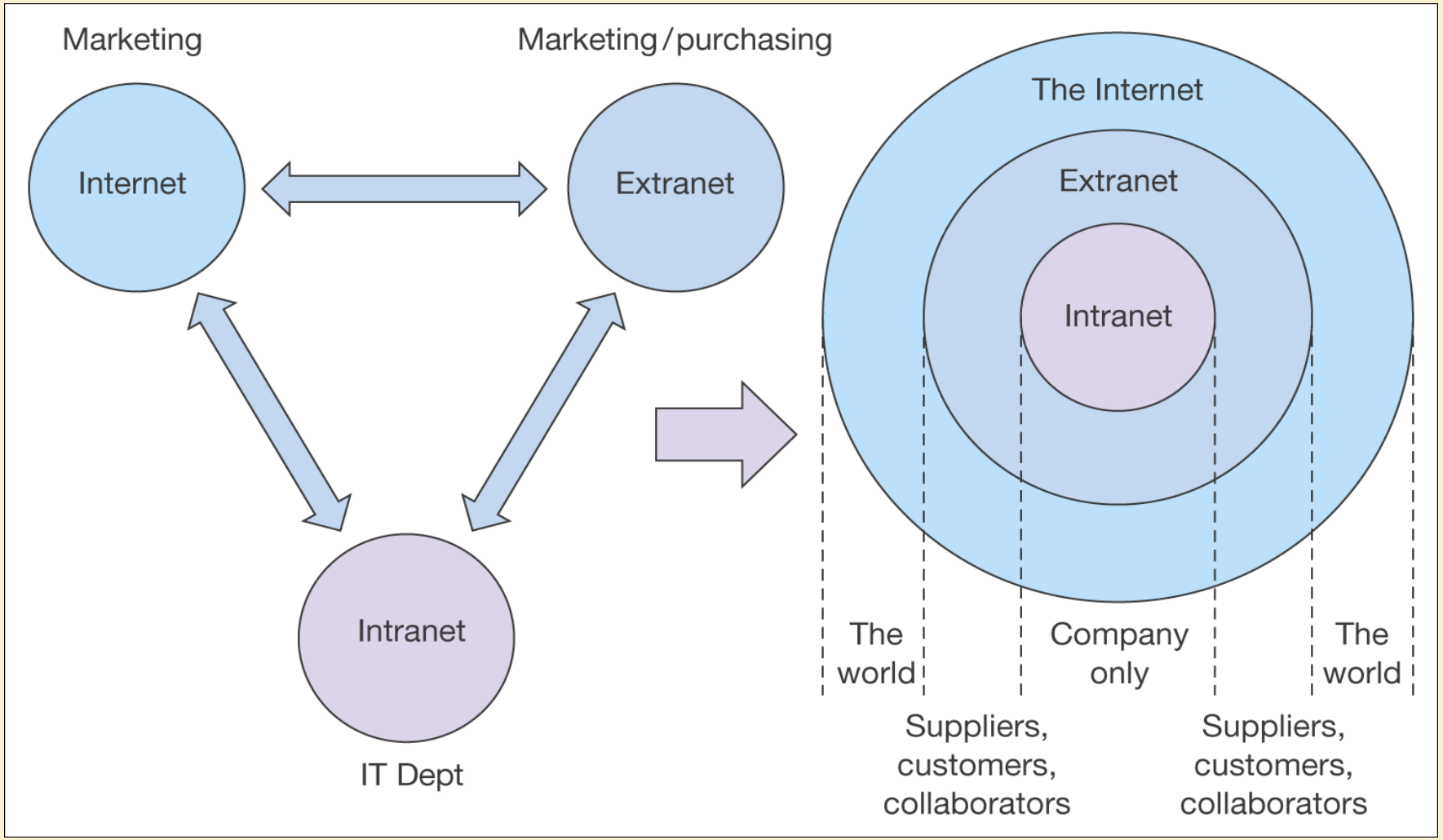


Figure 1.3: The relationship between intranets, extranets and the Internet.

The Worldwide Growth of B2C E-Commerce

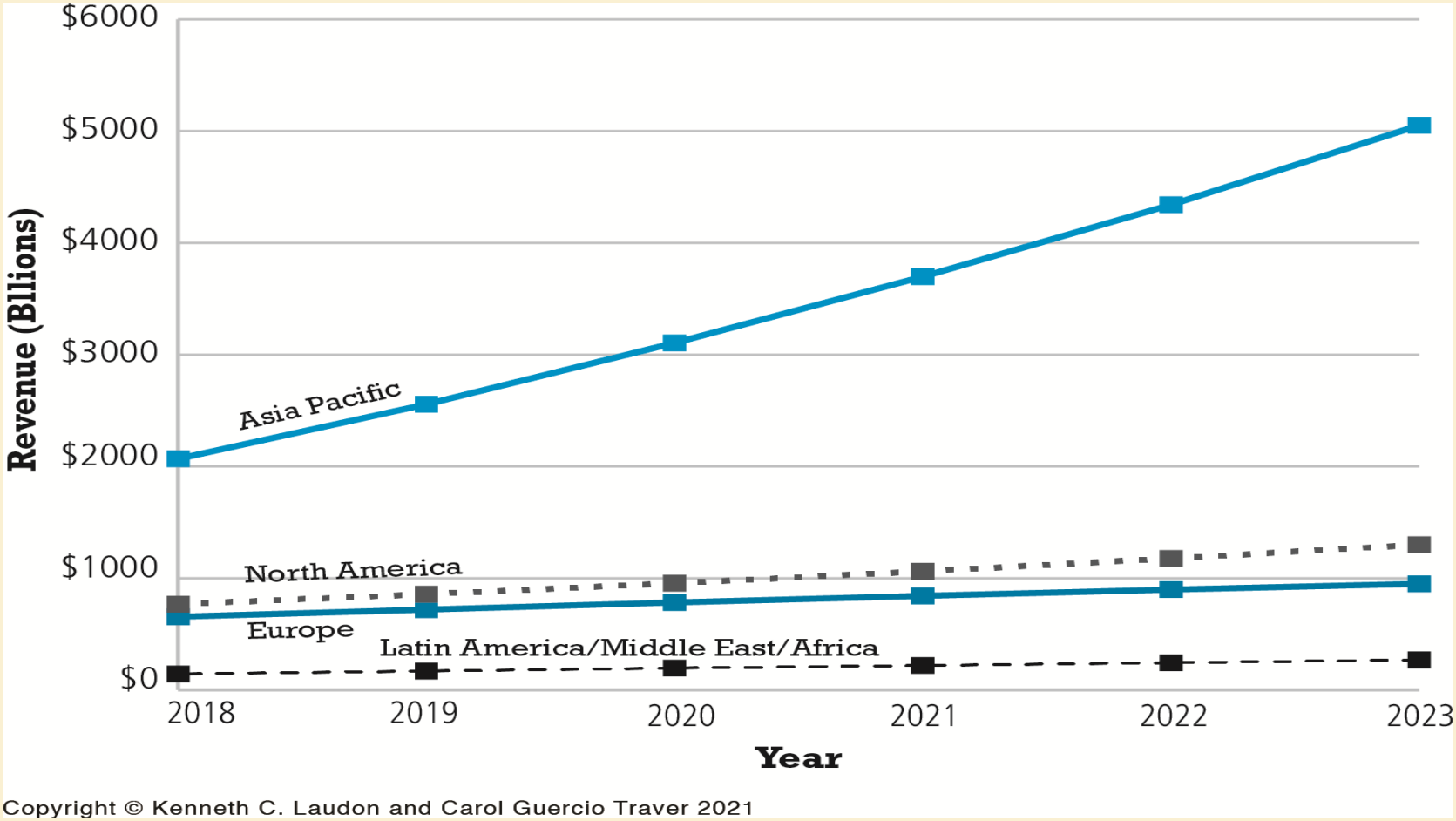


Figure 1.4: The Worldwide Growth of B2C E-Commerce.

The Growth of B2B E-Commerce in the United States

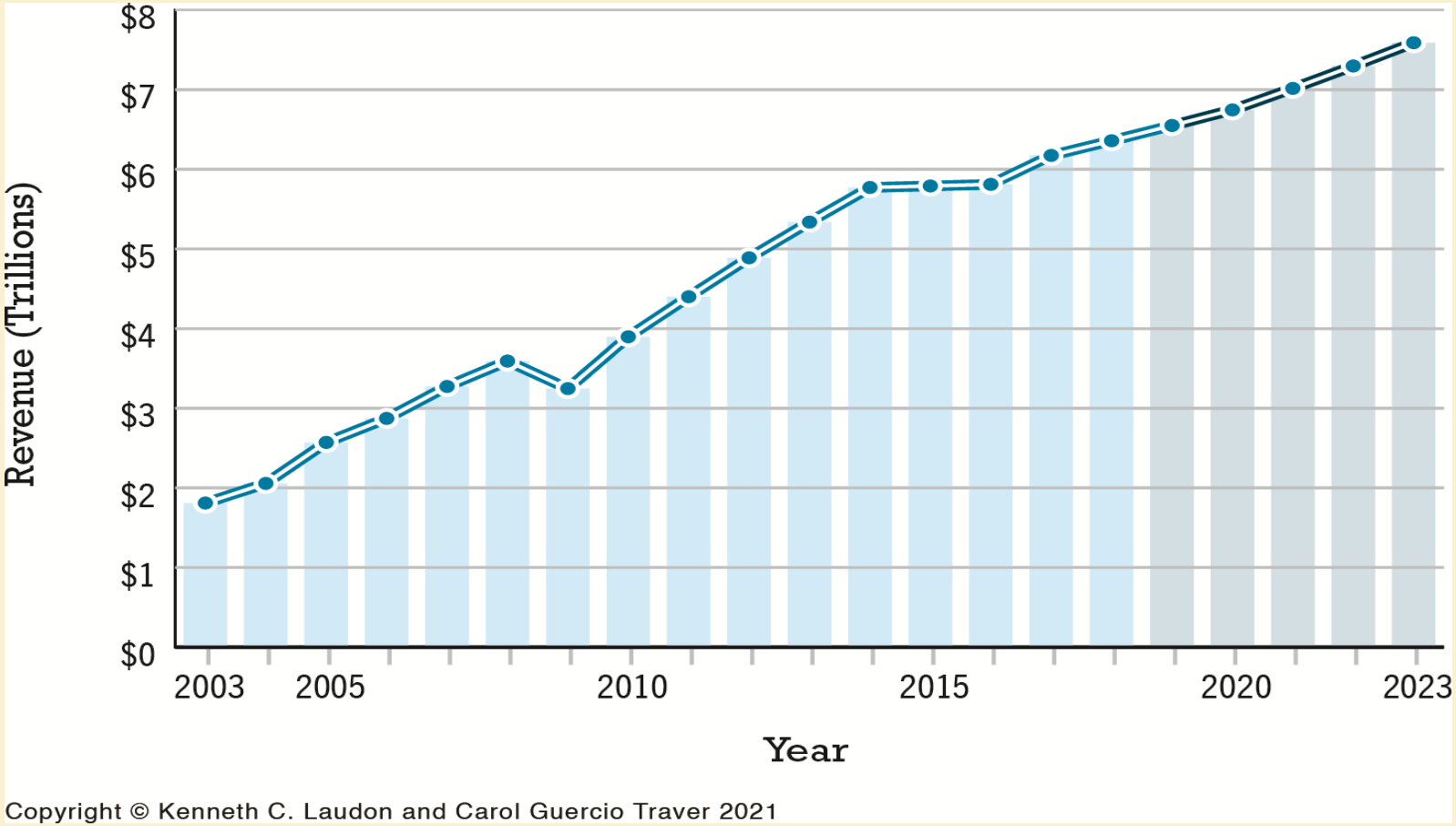


Figure 1.5: The Growth of B2B E-Commerce in the United States.

The Worldwide Growth of Retail M-Commerce

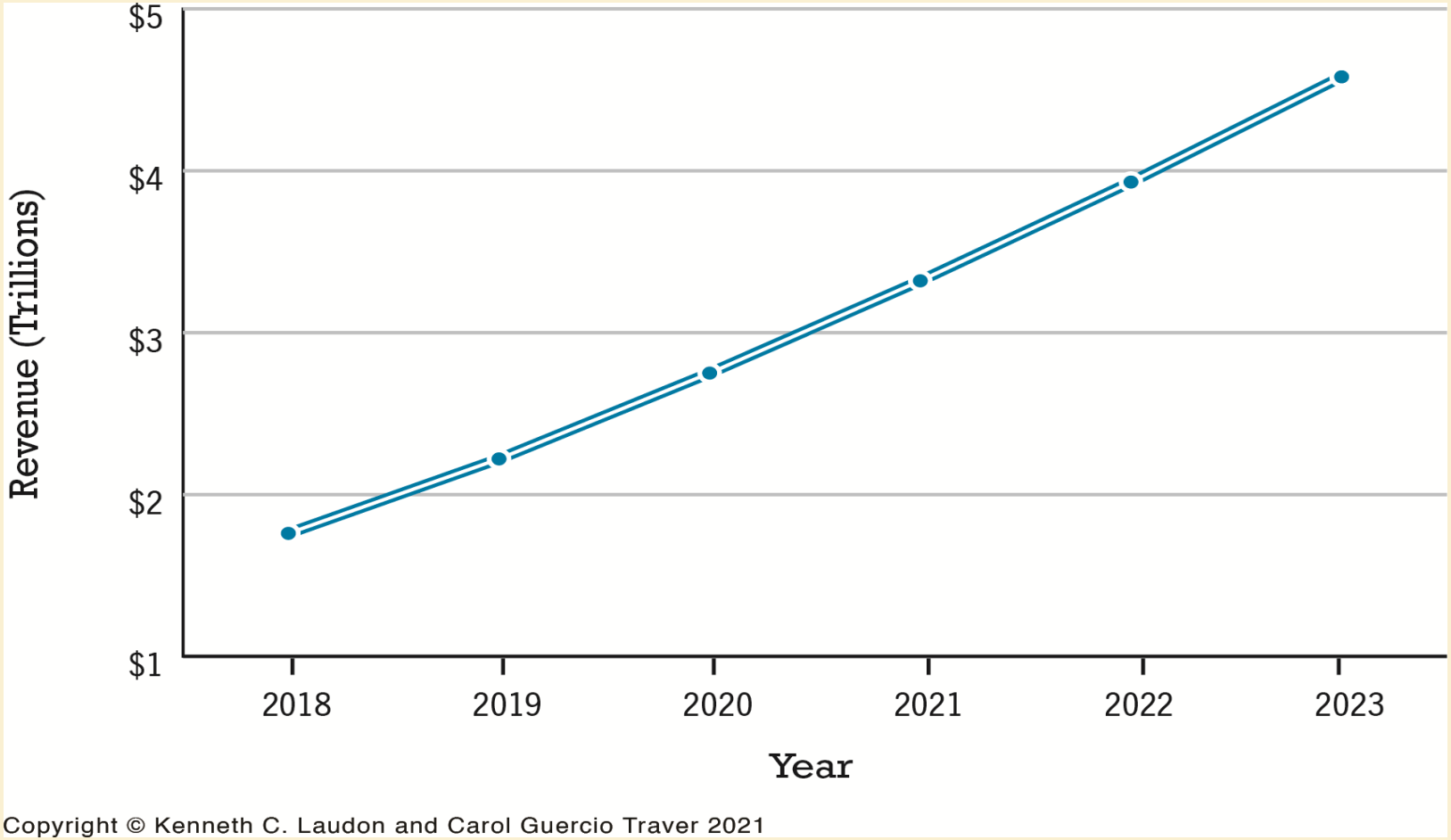


Figure 1.6: The Worldwide Growth of Retail M-Commerce.

Types of E-business

Figure 1.7: Types of E-business. Source: https://www.sydle.com/blog/what-is-e-business-61676092830b254194e0eb1f

Types of E-business

Figure 1.8: Types of E-business. Source: https://www.sydle.com/blog/what-is-e-business-61676092830b254194e0eb1f

Types of E-business

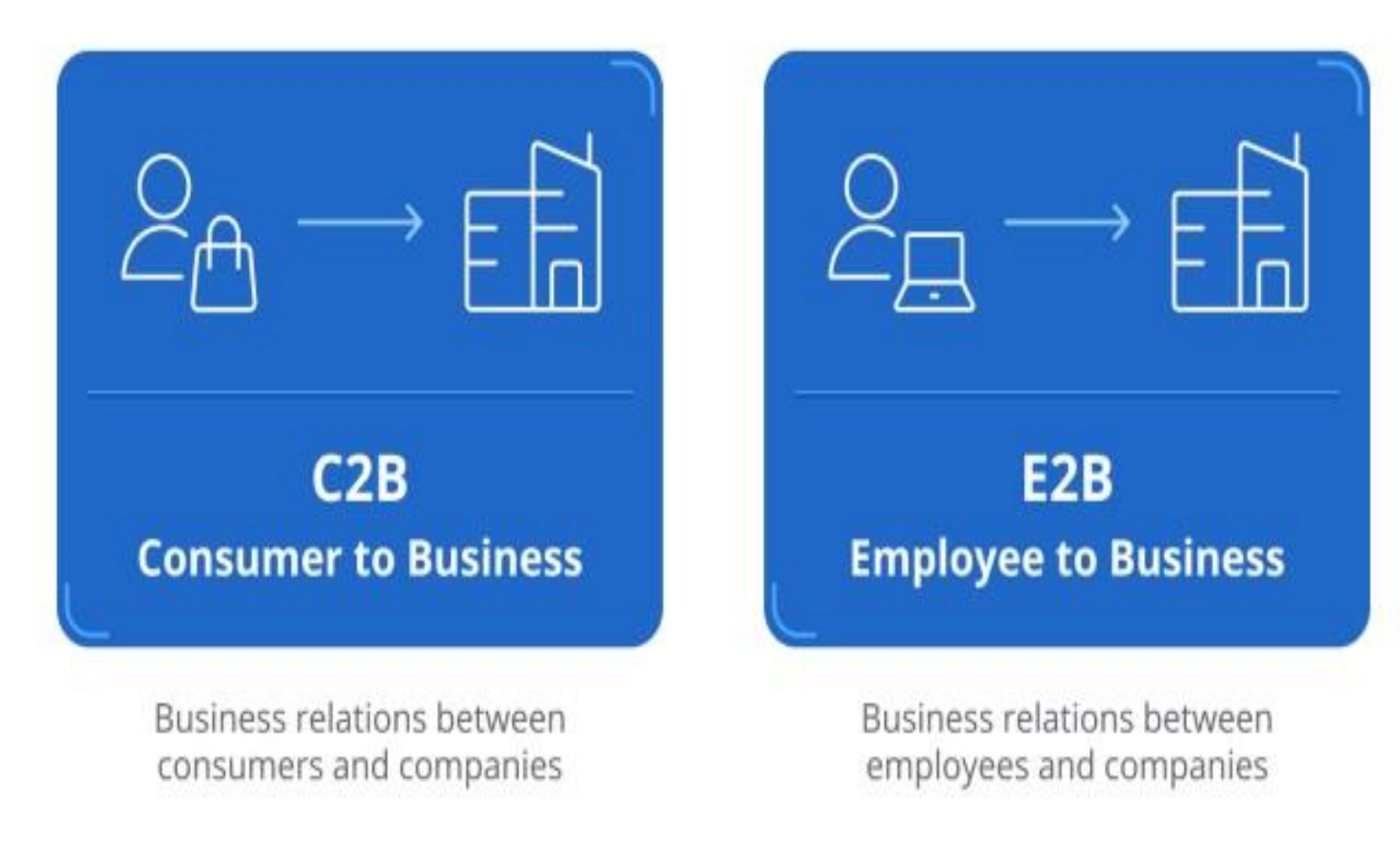


Figure 1.9: Types of E-business. Source: https://www.sydle.com/blog/what-is-e-business-61676092830b254194e0eb1f

Types of E-business

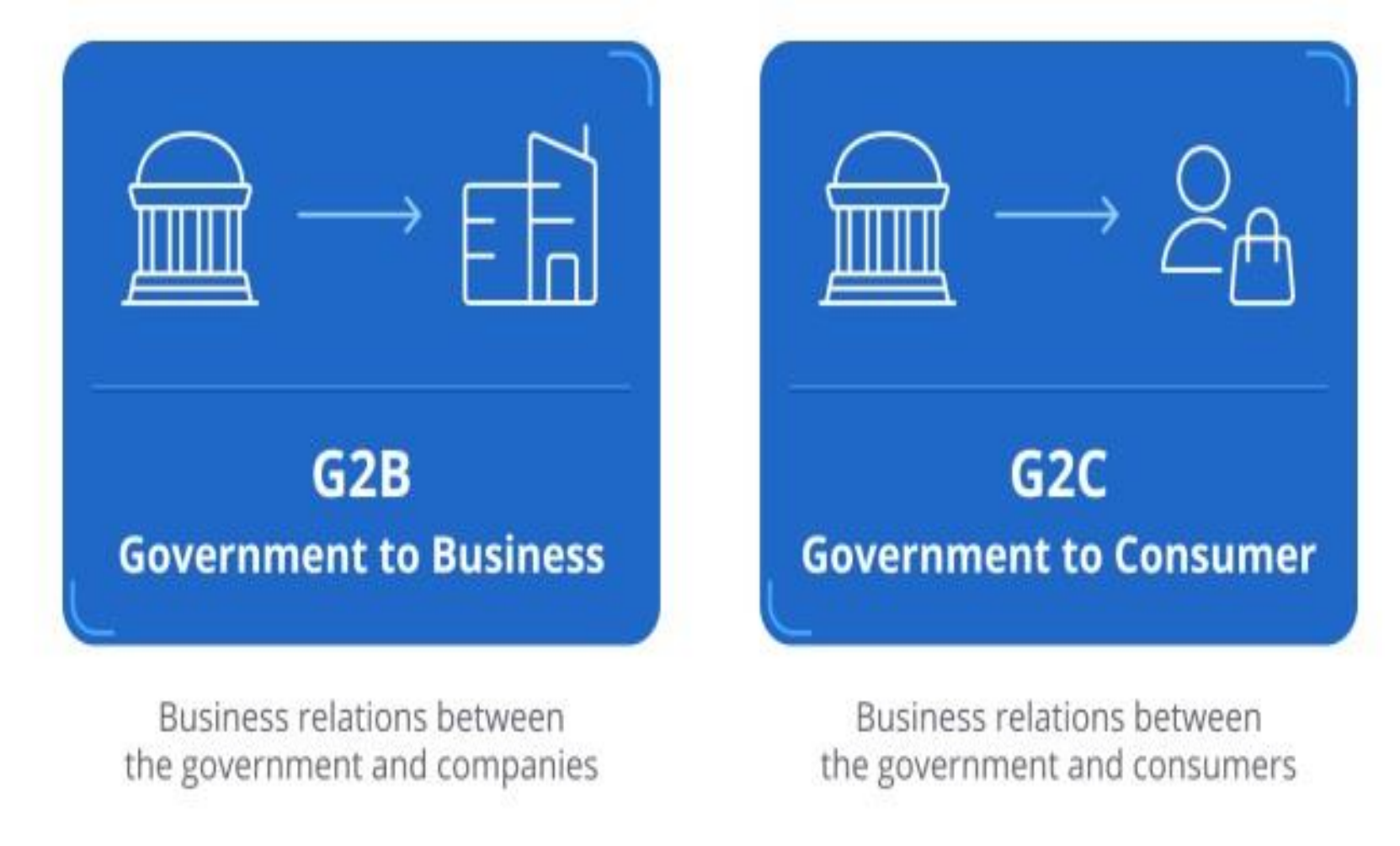


Figure 1.10: Types of E-business. Source: https://www.sydle.com/blog/what-is-e-business-61676092830b254194e0eb1f

Types of E-business

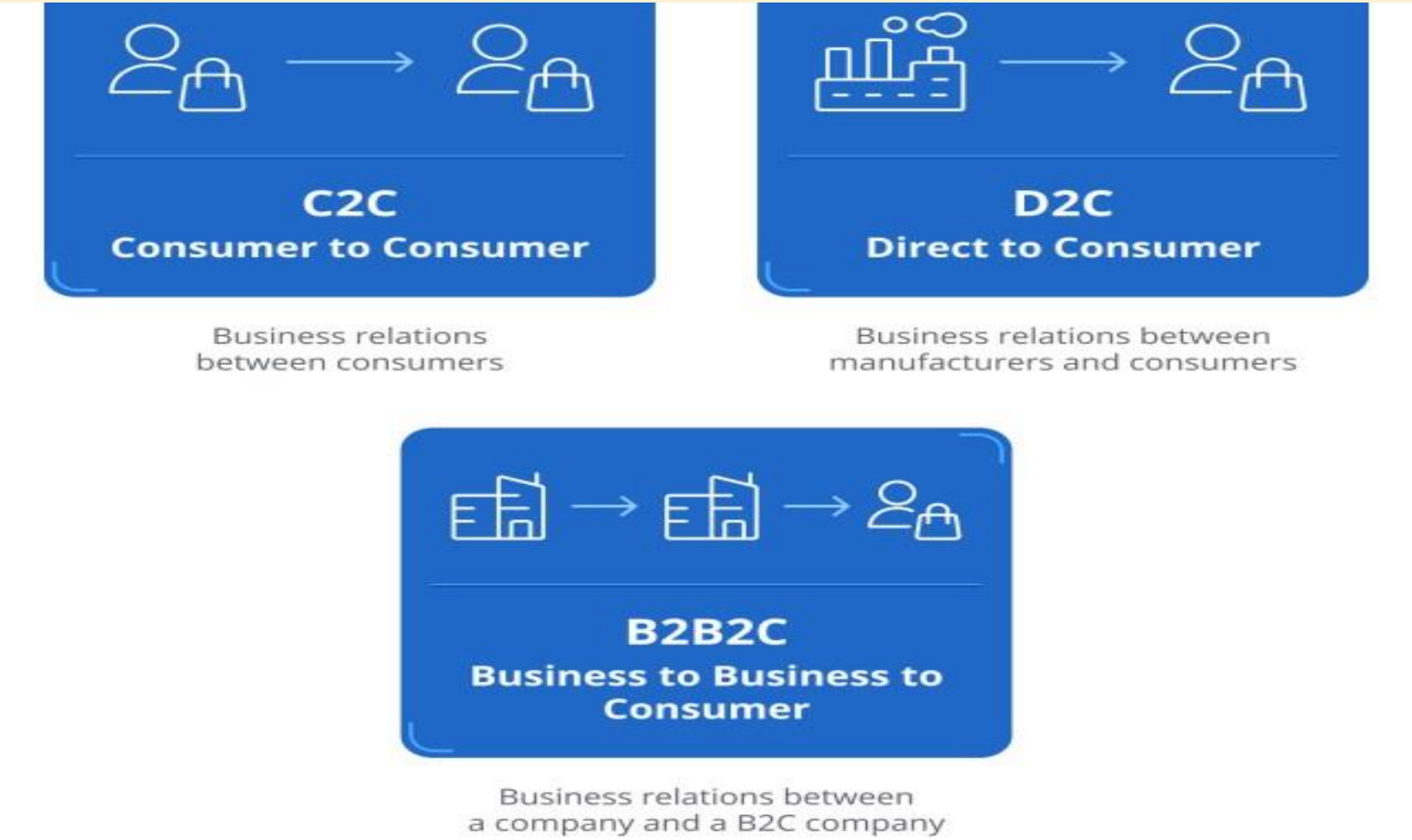


Figure 1.11: Types of E-business. Source: https://www.sydle.com/blog/what-is-e-business-61676092830b254194e0eb1f

Applications of E-business

Applications of E-business	
1	Enterprise resource planning (ERP)
2	Customer relationship management (CRM)
3	Supply chain management (SCM)
4	Integrated Enterprise Management System (IEMS)
5	Electronic data interchange (EDI)
6	Inventory/stock control & purchasing
7	Social media/ Online advertising
8	E-procurement/ E-banking/ E-commerce/ E-marketplace
9	Human resource management
10	Booking system
11	...

Table 1.2: Applications of E-business. Source: Hadi Putra P. O. and Santoso H. B., Contextual factors and performance impact of e-business use in Indonesian small and medium enterprises (SMEs), Heliyon, 2020.

In conclusion

- What is E-business?
- The difference between E-Commerce and E-Business
- The distinction between buy-side and sell-side E-commerce
- Three definitions of the relationship between E-commerce and E-business
- The relationship between intranets, extranets and the Internet
- Types of E-business
- Applications of E-business

Understand

2. Technologies used in E-business

A five-layer model of e-business infrastructure

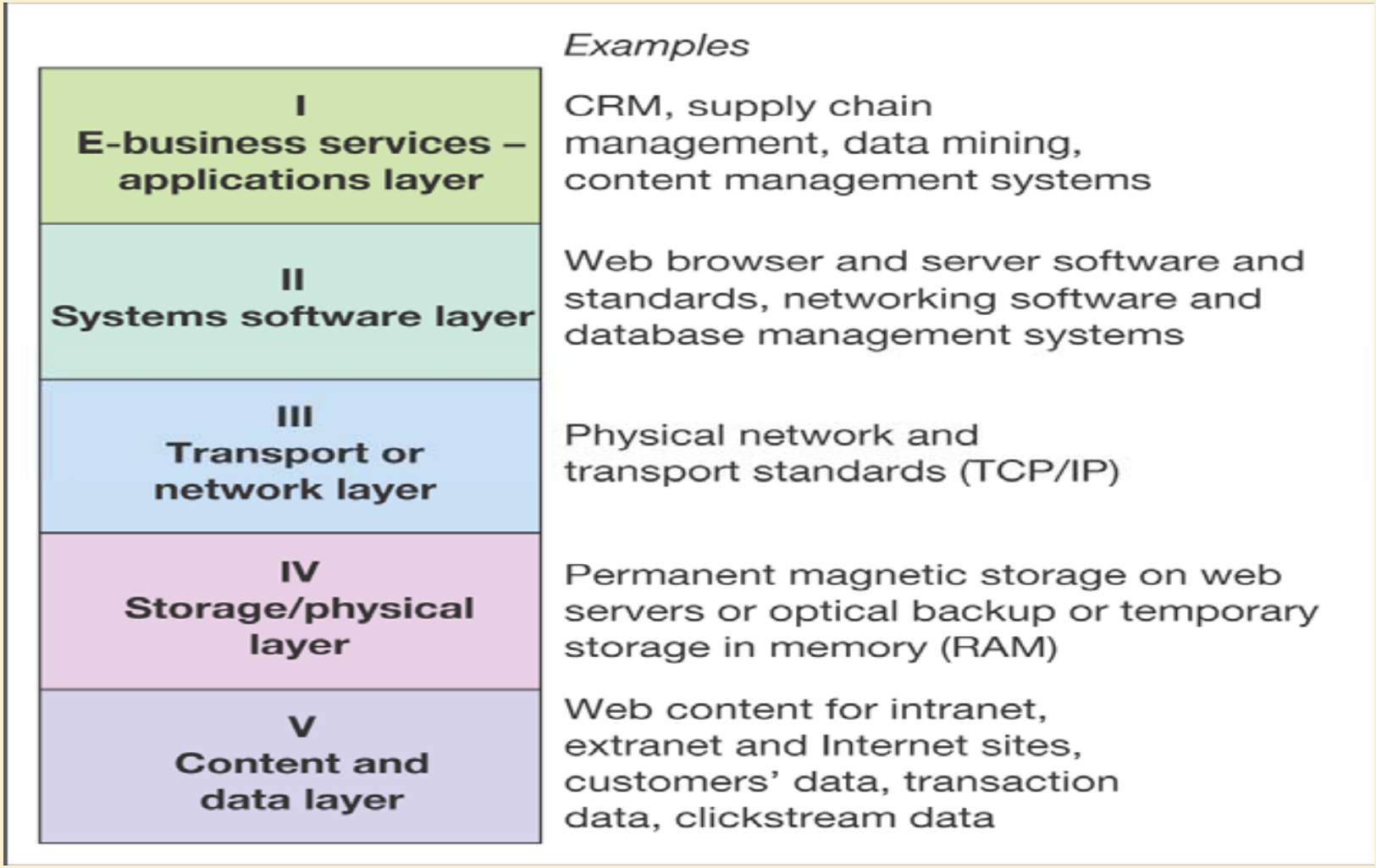


Figure 1.12: A five-layer model of e-business infrastructure.

The TCP/IP Architecture and Protocol Suite

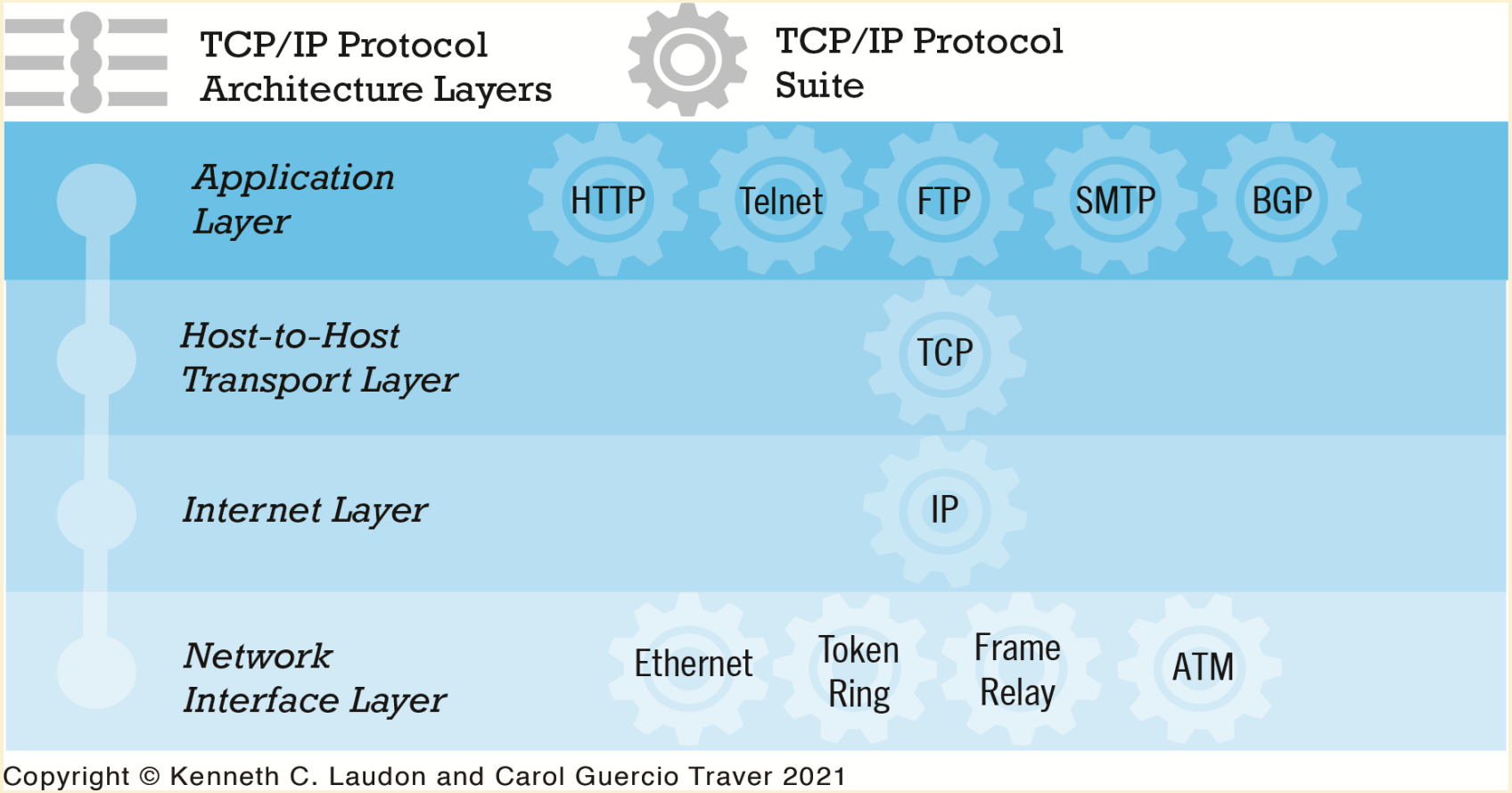


Figure 1.13: The TCP/IP Architecture and Protocol Suite.

Comparison between OSI model and TCP/IP Protocol layering

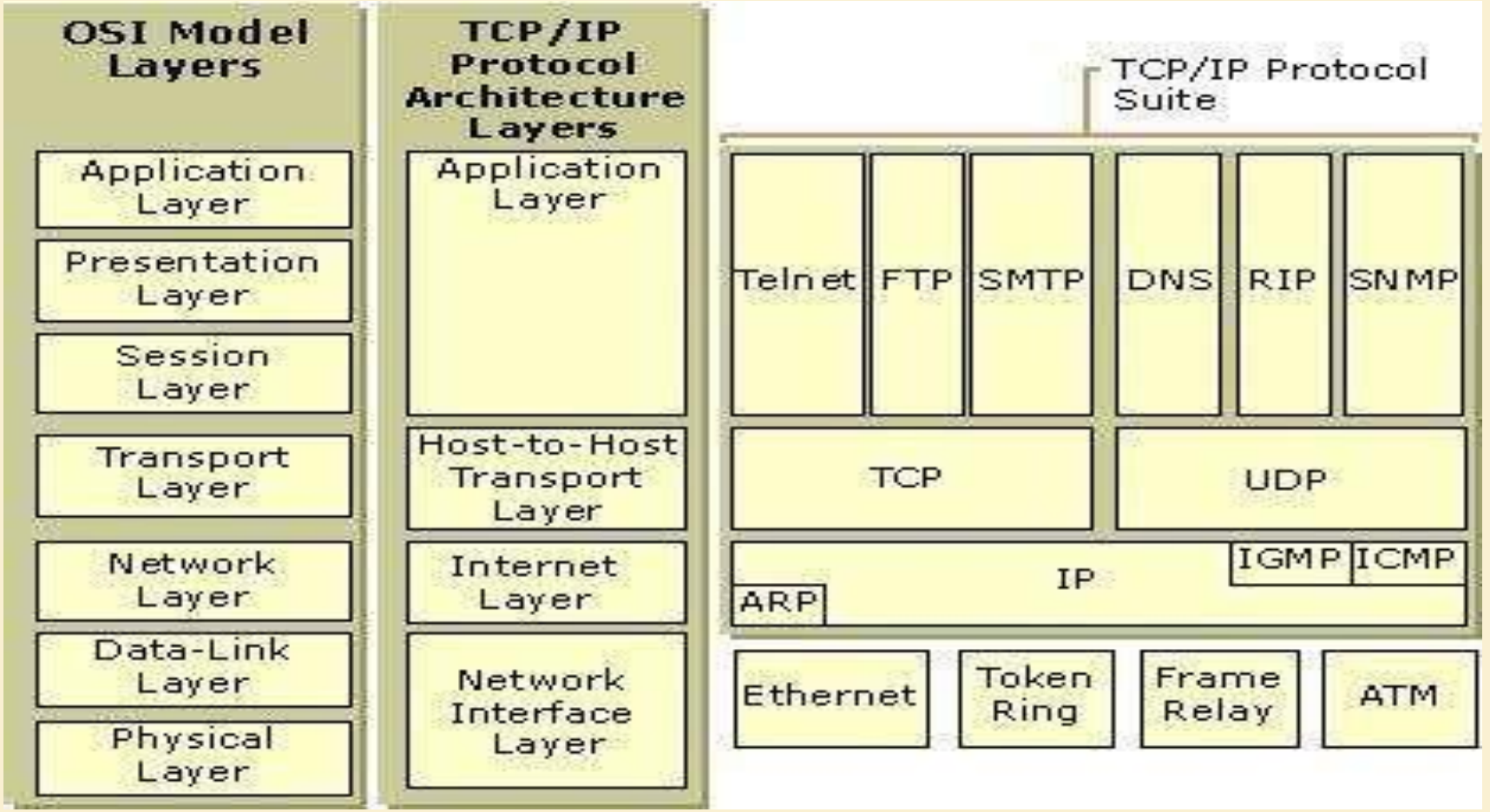


Figure 1.14: Comparison between OSI model and TCP/IP Protocol layering. Source: Mundra S. and El Taeib T., TCP/IP protocol layering, International Journal of Computer Science and Information Technology Research, 2015.

The Internet: Technology Background

- Internet
  - Interconnected network of thousands of networks and millions of computers
  - Links businesses, educational institutions, government agencies, and individuals
- World Wide Web (Web)
  - One of the Internet's most popular services
  - Provides access to billions, possibly trillions, of web pages

The Evolution of the Internet 1961–Present

- Innovation Phase, 1961–1974
  - Creation of fundamental building blocks
- Institutionalization Phase, 1975–1995
  - Large institutions provide funding and legitimization
- Commercialization Phase, 1995–present
  - Private corporations take over, expand the Internet backbone and local service

The Internet: Key Technology Concepts

- Internet defined as network that:
  - Uses IP addressing
  - Supports TCP/IP
  - Provides services to users, in manner similar to telephone system
- Three important concepts:
  - Packet switching
  - TCP/IP communications protocol
  - Client/server computing

Packet Switching

- Slices digital messages into packets
- Sends packets along different communication paths as they become available
- Reassembles packets once they arrive at destination
- Uses routers
- Less expensive, wasteful than circuit-switching

Packet Switching

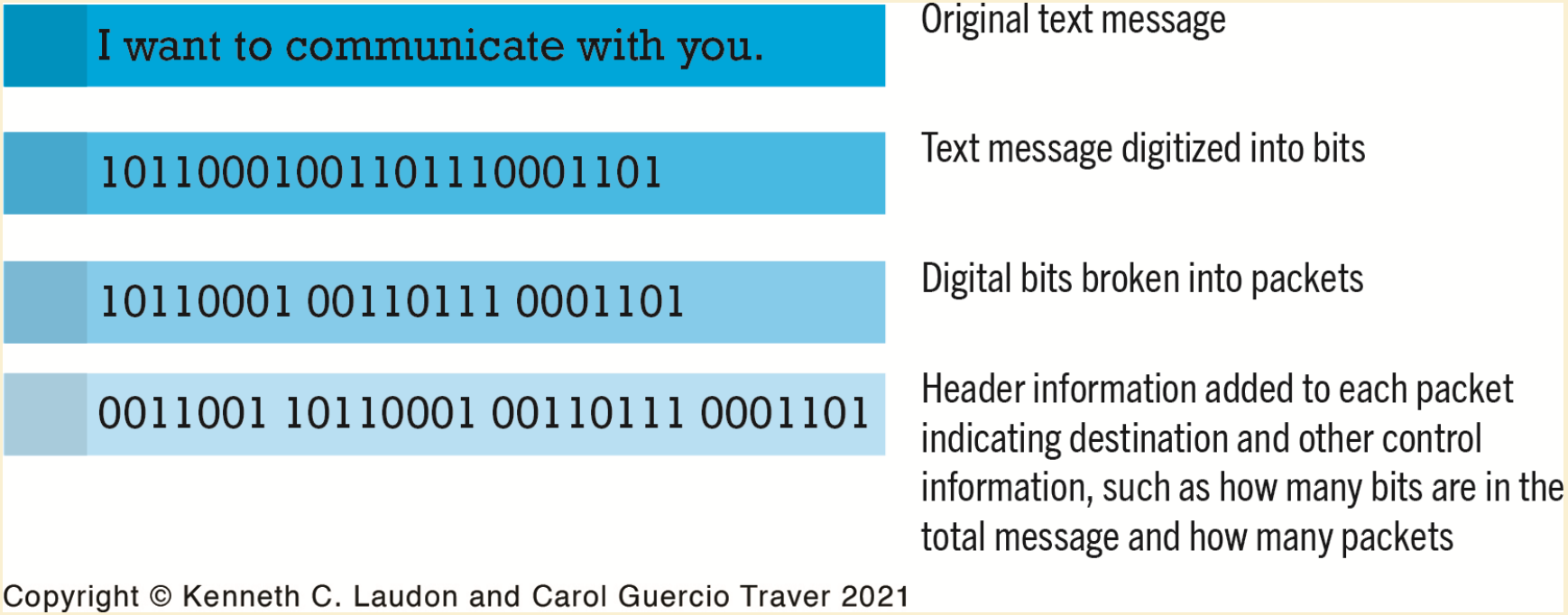


Figure 1.15: Packet switching.

TCP/IP

- Transmission Control Protocol (TCP)
  - Establishes connections among sending and receiving Web computers
  - Handles assembly of packets at point of transmission, and reassembly at receiving end
- Internet Protocol (IP)
- Four TCP/IP layers
  - Network interface layer
  - Internet layer
  - Transport layer
  - Application layer

Internet (IP) Addresses

- IP v4
  - 32-bit number
  - Four sets of numbers marked off by periods: 201.61.186.227
    - Class C address: Network identified by first three sets, computer identified by last set
- IP v6
  - 128-bit addresses, able to handle up to 1 quadrillion addresses (IP v4 can handle only 4 billion)

Routing Internet Messages: TCP/IP and Packet Switching

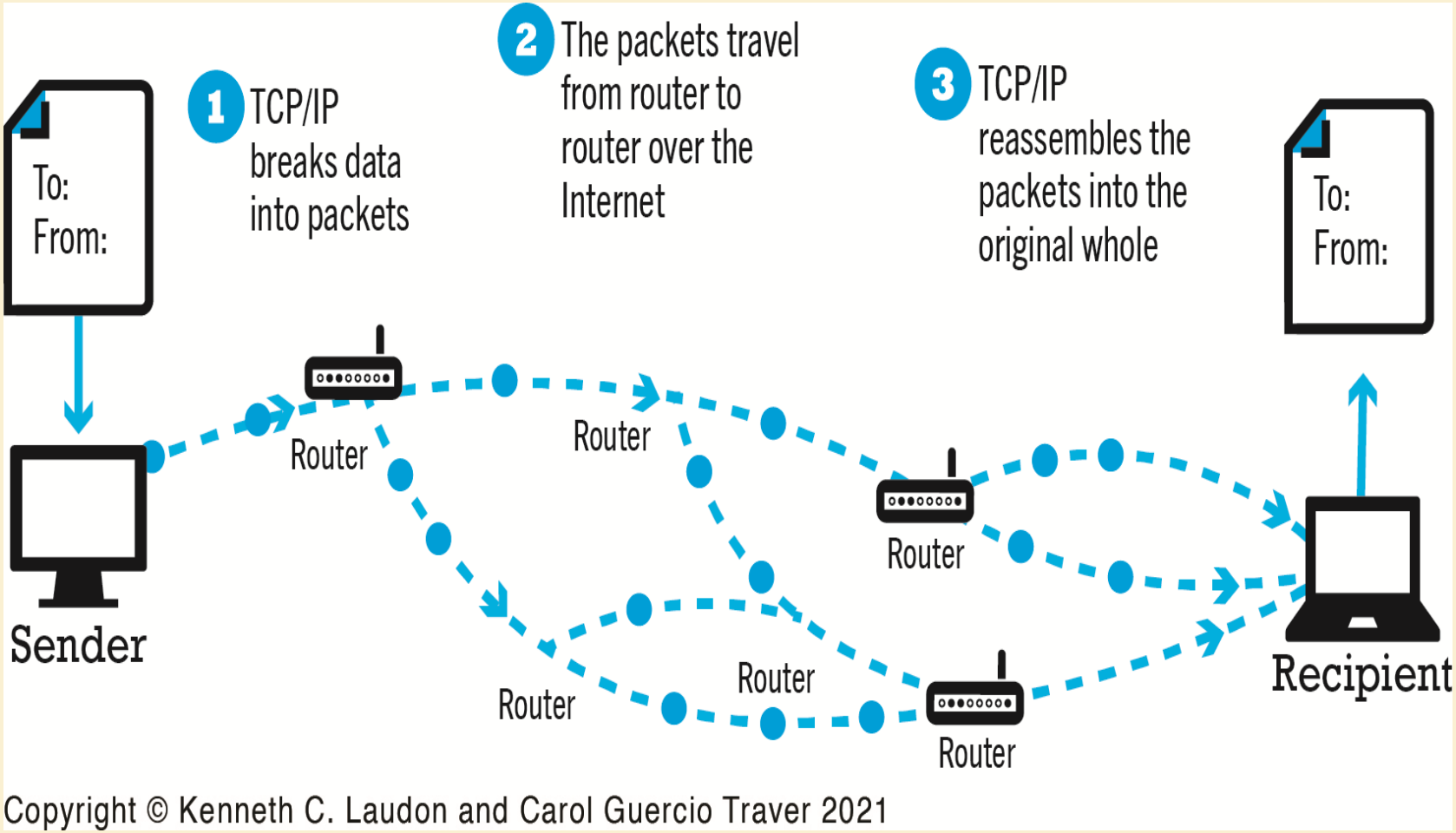


Figure 1.16: Routing Internet Messages: TCP/IP and Packet Switching.

Domain Names, DNS, and URLs

- Domain name
  - IP address expressed in natural language
- Domain name system (DNS)
  - Allows numeric IP addresses to be expressed in natural language
- Uniform resource locator (URL)
  - Address used by Web browser to identify location of content on the Web
  - For example: http://www.azimuth-interactive.com/

Client/Server Computing

- Powerful personal computers (clients) connected in network with one or more servers
- Servers perform common functions for the clients
  - Storing files
  - Software applications
  - Access to printers, and so on

The Mobile Platform

- Primary Internet access is now through tablets and smartphones
  - Smartphones are a disruptive technology
    - New processors and operating systems
    - Over 3.3 billion worldwide access Internet with smartphones

The Internet "Cloud Computing" Model

- Firms and individuals obtain computing power and software over Internet
- Three types of services
  - Infrastructure as a service (IaaS)
  - Software as a service (SaaS)
  - Platform as a service (PaaS)
- Public, private, and hybrid clouds

The Internet "Cloud Computing" Model (Cont.)

- Disadvantages
  - Security risks
  - Shifts responsibility for storage and control to providers
- Radically reduces costs of:
  - Building and operating websites
  - Infrastructure, IT support
  - Hardware, software

Other Internet Protocols and Utility Programs

- Internet protocols
  - HTTP
  - E-mail: SMTP, POP3, IMAP
  - FTP, Telnet, SSL/TLS
- Utility programs
  - Ping
  - Tracert
  - Etc.

Internet Infrastructure

- Internet growth has boomed without disruption because of:
  - Client/server computing model
  - Hourglass, layered architecture
    - ✓ Network Technology Substrates
    - ✓ Transport Services and Representation Standards
    - ✓ Middleware Services
    - ✓ Applications

The Hourglass Model of the Internet

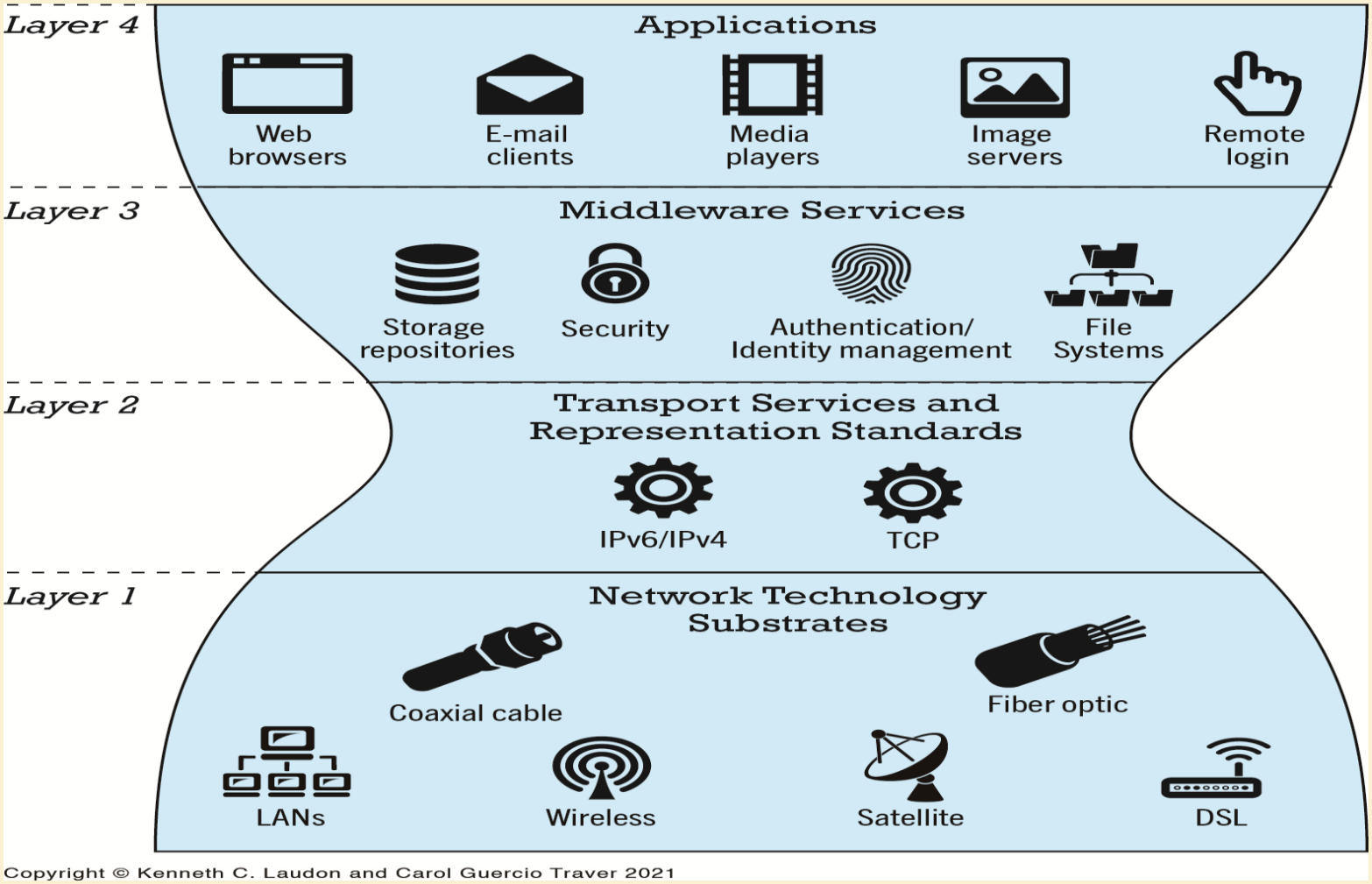


Figure 1.17: The Hourglass Model of the Internet.

Internet Network Architecture

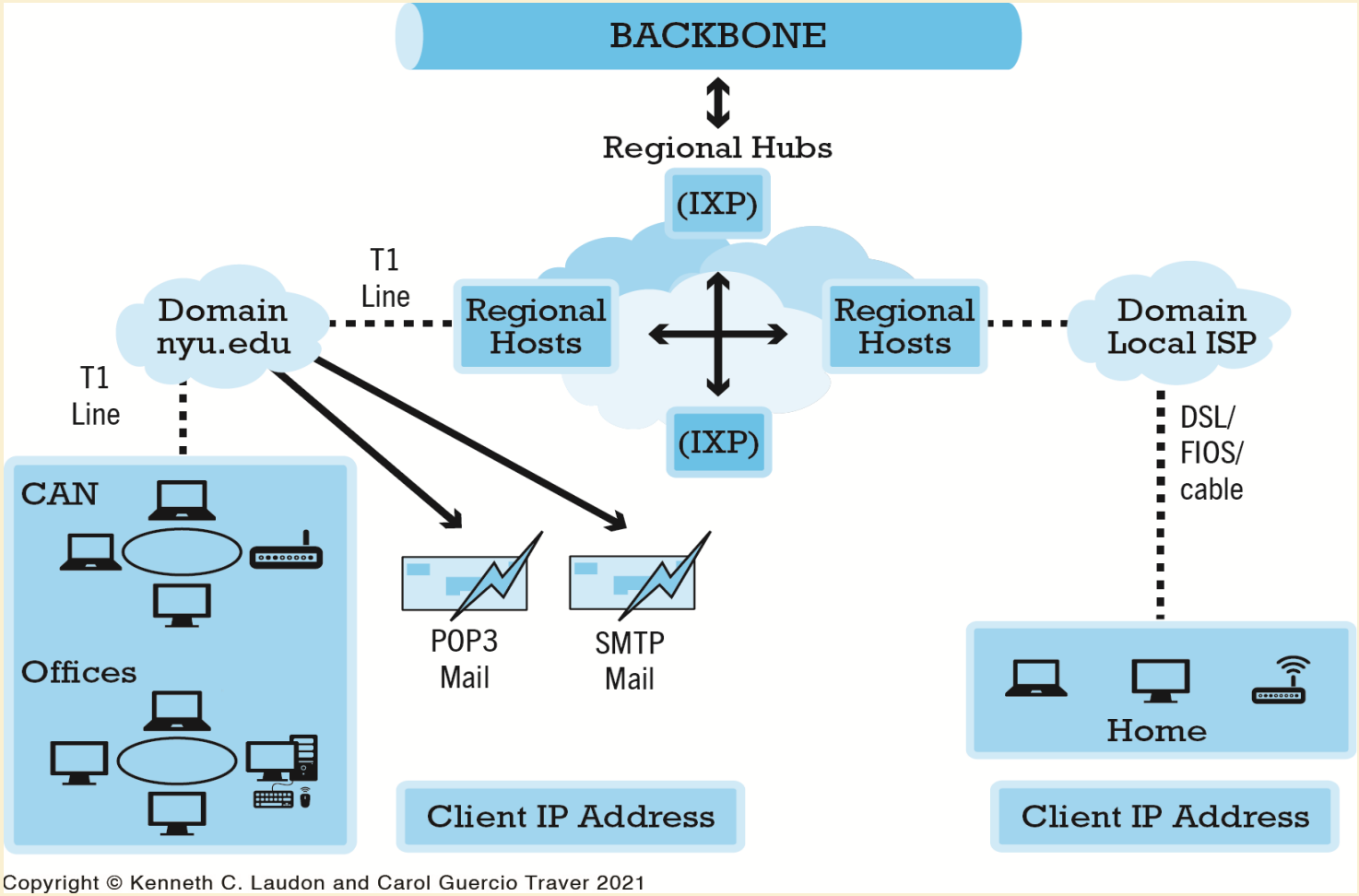


Figure 1.18: The Hourglass Model of the Internet.

The Internet Backbone

- Comprised of fiber-optic cable: hundreds of glass strands that use light to transmit data
  - Faster speeds and greater bandwidth
  - Thinner, lighter cables
  - Less interference
  - Better data security
- Tier 1 Internet Service Providers (Tier 1 ISPs) or transit ISPs
- Numerous private networks physically connected to each other
- Undersea fiber optics, satellite links

Internet Exchange Points (IXPs)

- Regional hubs where Tier 1 ISPs physically connect with one another and with regional Tier 2 ISPs.
- Tier 2 ISPs provide Tier 3 ISPs with Internet access.
- Originally called Network Access Points (NAPs) or Metropolitan Area Exchanges (MAEs).

Tier 3 Internet Service Providers

- Retail providers
  - Lease Internet access to home owners, small businesses
  - Large providers: Comcast, Charter Spectrum, A T&T, Verizon, Altice (Optimum)
  - Smaller local providers
- Services
  - Narrowband
  - Broadband
  - Digital subscriber line (DSL)
  - Cable Internet
  - Satellite Internet

Campus/Corporate Area Networks

- Local area networks operating within single organization, such as NYU or Microsoft Corporation
- Lease Internet access directly from regional and national carriers

Mobile Internet Access

- Two basic types of wireless Internet access:
  - Telephone-based (mobile phones, smartphones)
  - Computer network-based (wireless local area network-based)
- Telephone-based wireless Internet access
  - Currently based on 4G technology
  - 5G provides higher bandwidth with speeds reaching 10 Gbps or more

Wireless Local Area Network (WLAN) - Based Internet Access

- Wi-Fi (various 802.11 standards)
  - High-speed, fixed broadband wireless L A N (WLAN)
  - Wireless access point (“hot spots”)
  - Limited range but inexpensive
- WiMax
- Bluetooth

Wi-Fi Networks

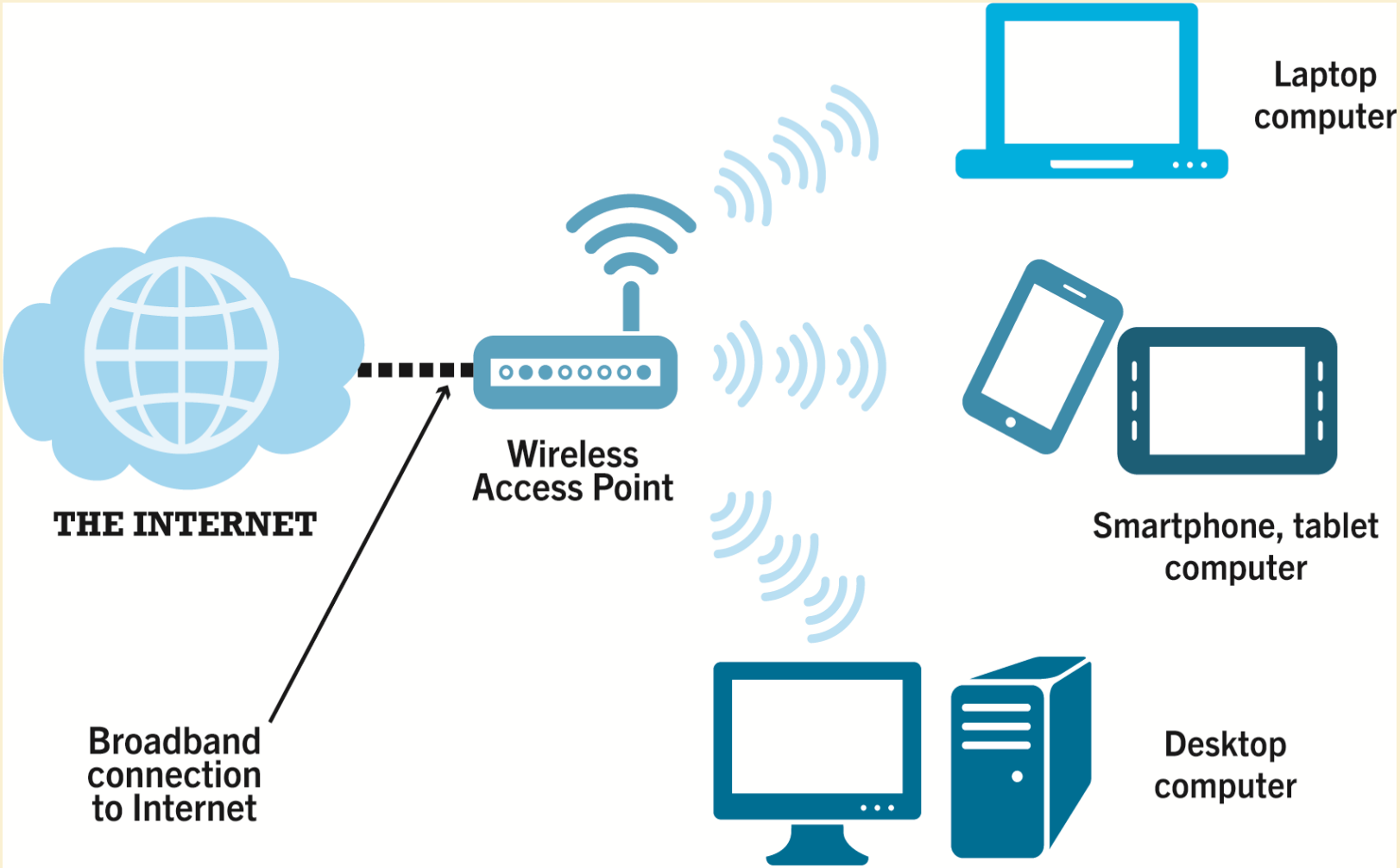


Figure 1.19: Wifi Networks.

The Internet of Things (IOT)

- Objects connected via sensors/RFID to the Internet
- “Smart things”
- Interactive issues and standards
- Security and privacy concerns

Who Governs the Internet?

- Organizations that influence the Internet and monitor its operations include:
  - Internet Corporation for Assigned Names and Numbers (ICANN)
  - Internet Engineering Task Force (IETF)
  - Internet Research Task Force (IRTF)
  - Internet Engineering Steering Group (IESG)
  - Internet Architecture Board (IAB)
  - Internet Society (ISOC)
  - Internet Governance Forum (IGF)
  - World Wide Web Consortium (W3C)
  - Internet Network Operators Groups (NOGs)

The Web

- 1989–1991: Web invented
  - Tim Berners-Lee at C E R N
  - H T M L, H T T P, web server, web browser
- 1993: Mosaic web browser w/G U I
  - Andreessen and others at N C S A
  - Runs on Windows, Macintosh, or Unix
- 1994: Netscape Navigator, first commercial web browser
- 1995: Microsoft Internet Explorer
- Present: Chrome, Firefox, Microsoft Edge, Opera, etc.

Hypertext

- Text formatted with embedded links
  - Links connect documents to one another, and to other objects such as sound, video, or animation files
- Uses Hypertext Transfer Protocol (HTTP) and URLs to locate resources on the Web
- Example URL:

https://vnexpress.net/

Markup Languages

- Hypertext Markup Language (HTML)
  - Fixed set of pre-defined markup “tags” used to format text
  - Controls look and feel of web pages
  - Used in conjunction with Cascading Style Sheets (CSS)
  - HTML5 the newest version
- eXtensible Markup Language (XML)
  - Designed to describe data and information
  - Tags used are defined by user

Web Servers and Web Clients

- Web server software
  - Enables a computer to deliver web pages to clients on a network that request this service by sending an HTTP request
  - Basic capabilities: Security services, FTP, search engine, data capture
- Web server
  - Refer to either web server software or physical server
  - Specialized servers: Database servers, ad servers,…
- Web client
  - Any computing device attached to the Internet that is capable of making HTTP requests and displaying HTML pages

Web Browsers

- Primary purpose is to display web page, but may include added features
  - Google's Chrome: more than 67% and 64% of the desktop and mobile markets, respectively
    - ✓ Open source
  - Internet Explorer: 8% of desktop, >1% mobile
  - Microsoft Edge: 5% of desktop
  - Mozilla Firefox: 9% desktop, >1% mobile
    - ✓ Open source
  - Apple's Safari: 4% desktop, 27% mobile

The Internet and Web: Features

- Features on which the foundations of e-commerce are built:
  - Communication tools
  - Search engines
  - Downloadable and streaming media
  - Web 2.0 applications and services
  - Virtual reality and augmented reality
  - Intelligent digital assistants
  - Etc.

Communication Tools

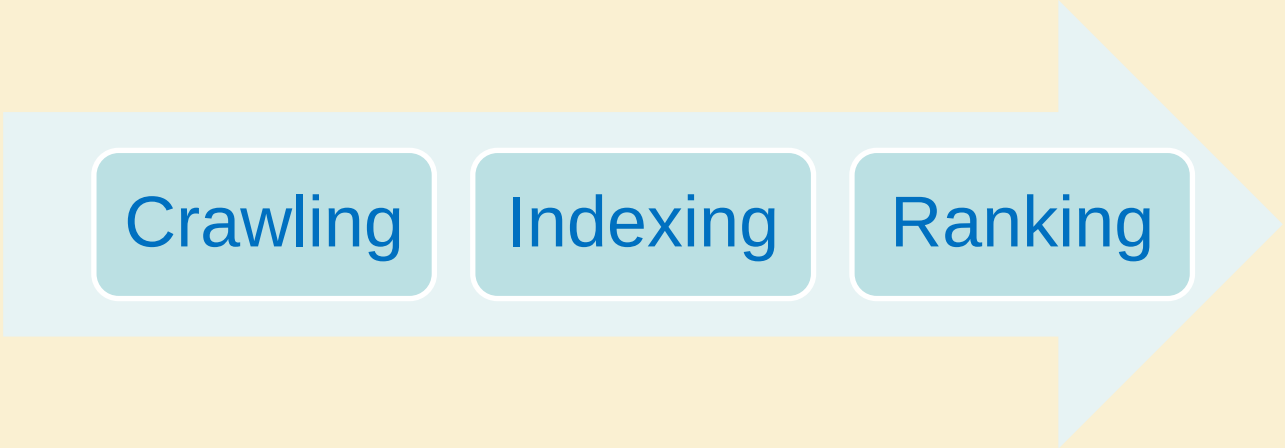
- E-mail
  - Most used application of the Internet
- Messaging Applications
  - Instant messaging
- Online message boards
- Internet telephony
  - VOIP
- Video conferencing, video chatting, telepresence
- Etc.

How do Search Engines work?

Source: https://www.youtube.com/watch?v=W5h22tgPAS8

Activity of Search Engines

- To find relevant content on web pages, search engines are constantly performing three tasks:



Search engines use "crawlers," programs that visit every page of each site online to determine what content they hold

Search engines create an index of all content stored online

Search engines ultimately rank them based on relevancy & authority (popularity)

How Google Works

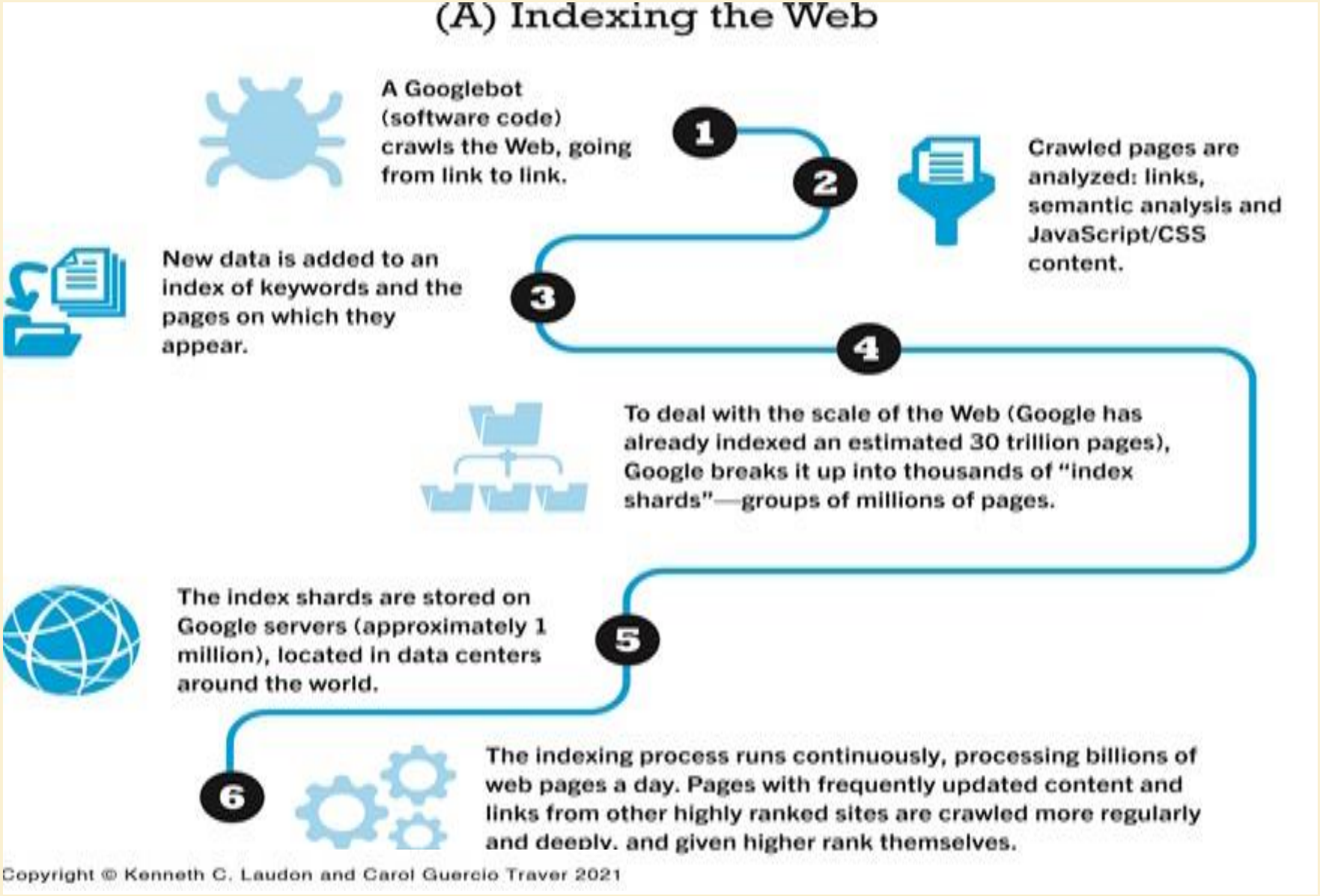


Figure 1.20: How Google Works.

How Google Works (Cont.)

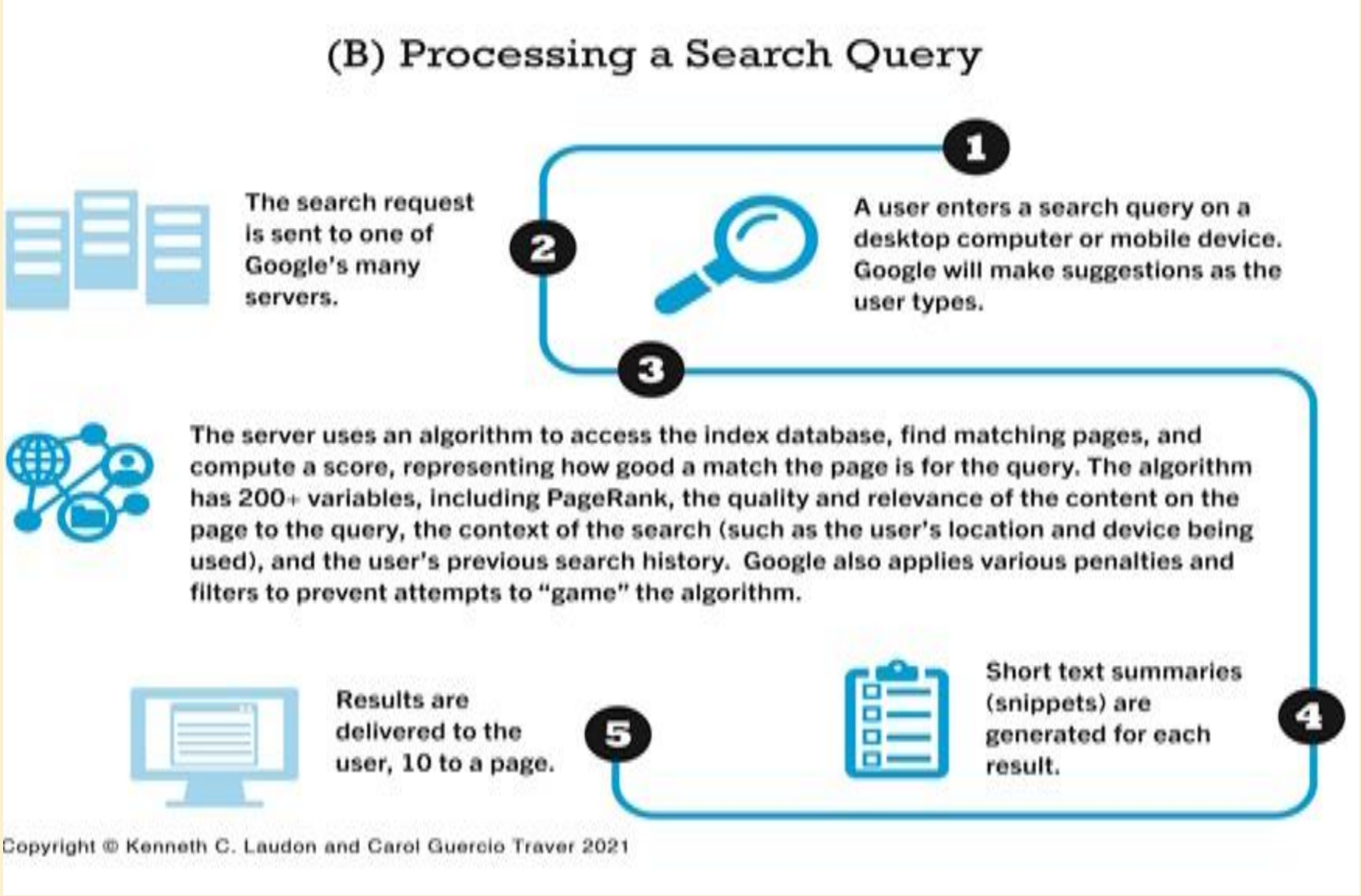


Figure 1.21: How Google Works.

Search Engines

- Identify web pages that match queries based on one or more techniques
  - Keyword indexes
  - Page ranking
- Also serve as:
  - Shopping tools
  - Advertising vehicles (search engine marketing)
  - Tool within e-commerce sites
- Top providers: Google, Bing, etc.

Downloadable and Streaming Media

- Downloads:
  - Growth in broadband connections enables large media file downloads
- Streaming technologies
  - Enables music, video, and other large files to be sent to users in chunks so that the file can play uninterrupted
- Podcasting
- Explosion in online video viewing

Web 2.0 Features and Services

- Online Social Networks
  - Services that support communication among networks of friends, peers
- Blogs
  - Personal web page bases on sequential entries of time
  - Enables web page publishing with no knowledge of HTML
- Wikis
  - Enables documents to be written collectively and collaboratively
  - E.g. Wikipedia

Virtual Reality and Augmented Reality

- Virtual reality (VR)
  - Putting users within virtual world
  - Typically uses head-mounted display (HMD)
  - Ex: PlayStation VR
- Augmented reality (AR)
  - Overlaying virtual objects over the real world, via mobile devices or HMDs

Intelligent Digital Assistants

- Computer search engine using:
  - Natural language
  - Conversational interface, verbal commands
  - Situational awareness
- Can handle requests for appointments, flights, routes, event scheduling, and more.
  - Examples:
    - Apple's Siri
    - Google Now
    - Google Assistant
    - Chat Box, Chat GPT, etc.

Mobile Apps

- Use of mobile apps has exploded
  - Most popular entertainment media, over TV
  - Always present shopping tool
  - Almost all top 100 brands have an app
- Platforms
  - iPhone/iPad (iOS), Android
- App marketplaces
  - Google Play, Apple's App Store, Amazon's Appstore, etc.

In conclusion

- The Internet: Technology Background
- The Internet: Key Technology Concepts
- The TCP/IP Architecture and Protocol Suite
- Internet Network Architecture
- Who Governs the Internet?
- How Google Works
- Downloadable and Streaming Media
- Web 2.0 Features and Services
- Virtual Reality and Augmented Reality
- Intelligent Digital Assistants
- Mobile Apps
- ….

Understand

THANK YOU
FOR YOUR ATTENTION

Q&A