INTERNET MEDIA
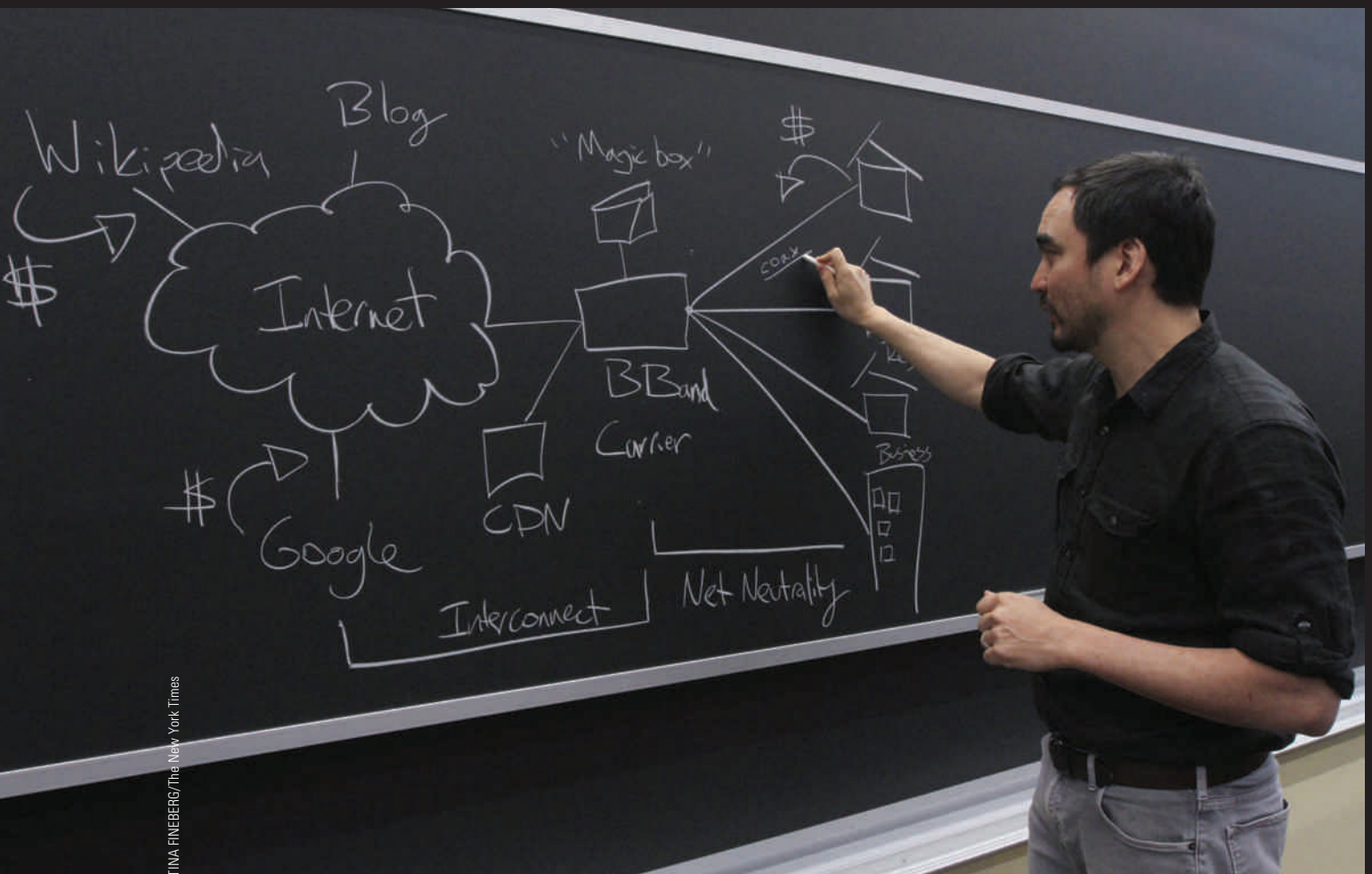## WIDENING THE WEB

Columbia University law professor Tim Wu, who coined the term *net neutrality*, argues that the federal government should guarantee equal Internet access for everyone through law and regulation.

What's Ahead?

- Digital Communication Transforms Media
- Digital Media Support Convergence
- 20th-Century Discoveries Made Internet Possible
- Web Opens to Unlimited Access
- What Happens to Old Media?
- Transformation Takes 30 Years

- Web Access Leaves Some People Behind
- Internet Combines Commerce, Information and Entertainment
- Mobile Media Chase the Audience
- Social Networks Grow Globally
- Government Attempts to Coordinate and Control the Net

- Protection Sought for Intellectual Property Rights
- FCC Promotes Internet Neutrality
- Storage, Competing Systems and Security Bring Challenges
- Disruptive Technologies Revolutionize Old Concepts
- Consumers Intersect with Technology

> "The FCC's Open Internet rules protect and maintain open, uninhibited access to legal online content without broadband Internet access providers being allowed to block, impair, or establish fast/slow lanes to lawful content."
>
> —FEDERAL COMMUNICATIONS COMMISSION, FEBRUARY 26, 2015

"Today's world has become so wired together, so flattened, that you can't avoid seeing just where you stand on the planet—just where the caravan is and just how far ahead or behind you are," says *New York Times* columnist Thomas L. Friedman. The main reason for today's flattened planet, of course, is the Internet. Within the last 30 years, the emergence of the Internet as an interactive delivery system has transformed the structure and the economics of the media business in the United States and throughout the world.

Before the 1970s, media were defined by the systems that delivered them. Paper delivered the print media—newspapers, magazines and books. Antennas carried broadcast signals—radio and television. Movies required film, and music traveled on round discs. These traditional media each were specifically connected to their own method of delivery and organized into different types of companies—newspaper, magazine and book publishers; recording and movie studios; and radio and TV stations.

Digital Communication Transforms Media

Today, the Internet delivers all types of media—print, broadcast, audio and video—using a single delivery system without barriers. You can receive all types of media just about anywhere you want, delivered by many different types of companies, carried on invisible electronic

signals. The Internet has caused the emergence of new media products and new competition in the media business that were impossible to foresee when the Internet first emerged as a place for consumers in 1978. Originally the Internet was designed by a group of scientists who were simply hoping to share information.

The Internet combines millions of computer networks sending and receiving data from all over the world—competing interests joined by a common purpose but no common owner. "No government or commercial entity owns the Net or directly profits from its operation," notes information designer Roger Fidler. "It has no president, chief executive officer or central headquarters."

In its global size and absence of central control, the Internet is completely different from traditional media. Originally developed to help researchers, scientists and educators communicate, the Internet has "evolved in a way no one planned or expected," says Fidler. "It is the relationships among people that have shaped the medium."

The term ***digital media*** describes all forms of communications media that combine text, pictures, sound

Digital Media All emerging communications media that combine text, graphics, sound and video using computer technology.

TimeFrame
1978–Today

Digital Media Covers the Globe

Bernard Gotfryd/Premium Archive/Getty Images

Denis Charlet/Getty Images

Bloomberg/Getty Images

1978 Nicholas Negroponte at MIT first uses the term *convergence* to describe the intersection of the media industries.

＊ **1984** Apple launches the Macintosh personal computer.

1988 Less than one-half of 1 percent of U.S. households are online.

1989 Tim Berners-Lee develops the first browser and programming languages that allow people to share all types of information online.

1992 Neil Papworth, a software programmer in England, sends the first text message.

1994 Marc Andreessen and his colleagues at the University of Illinois introduce the Mosaic browser.

1995 David Filo and Jerry Yang launch Yahoo! as a search engine company.

1996 Internet advertising reaches $200 million. Congress passes the Communications Decency Act.

1998 One in four U.S. households is online. Congress passes the Digital Millennium Copyright Act. Larry Page and Sergey Brin launch Google.

1999 The Recording Industry Association of America (RIAA) sues Internet file-sharing company Napster for copyright infringement.

2000 The number of Internet businesses explodes.

2001 File-sharing company Napster shuts down. The number of Internet startups begins to shrink, and many existing companies close.

2003 RIAA and the Motion Picture Association of America announce campaigns to aggressively fight online piracy.

2004 Mark Zuckerberg launches Facebook as a social networking site.

2005 File-sharing company Grokster shuts down, settling a landmark intellectual property case.

2006 Internet advertising reaches $17 billion.

2007 Apple introduces the iPhone.

＊ **2008** Google celebrates its tenth anniversary.

2010 Apple introduces the iPad and the iPhone 4.

2011 Apple launches iCloud. Apple's App Store reaches 25 billion downloads. Twitter hits 100 million users. Apple CEO Steve Jobs dies.

2012 Facebook has 1 billion monthly users.

2013 President Obama signs an executive order promoting cybersecurity.

＊ **2015** The Federal Communications Commission approves net neutrality, guaranteeing equal access to the Internet.

TODAY Four out of five American adults use the Internet. Fifty-two percent of online adults use two or more social media sites. Businesses spend more than $51 billion a year for Internet advertising.

and video using computer technology. Digital media read, write and store data electronically in numerical form—using numbers to code the data (text, pictures, sound and video). Because all digital media use the same numbered codes, digital media are ***compatible***, which means they can function well with one another to exchange and integrate text, pictures, sound and video. This compatibility is the main reason digital media are growing so fast. Because of its rapid growth, digital communications has become the central factor affecting the development of today's mass media industries.

Rather than the one-way communication of traditional media, communication on today's compatible digital networks means someone can receive and send information simultaneously, without barriers. Digital networks "free individuals from the shackles of corporate bureaucracy and geography and allow them to collaborate and exchange ideas with the best colleague anywhere in the world," said futurist George Gilder. "Computer networks give every hacker the creative potential of a factory tycoon of the industrial [turn-of-the-century] era and the communications power of a TV magnate of the broadcasting era."

In an interconnected digital world, the speed and convenience of the network redefines the mass media industries and erases all previous notions of how mass communications should work. Today's media are constantly evolving. Digital media forms "do not arise spontaneously and independently from old media," says media scholar Roger Fidler. Digital media are related and connected to old media. Fidler says today's media are members of an interdependent system, with "similarities and relationships that exist among past, present and emerging forms."

Digital media are similar to traditional media yet different in ways that make them distinct from their predecessors. Because of the interdependence of today's mass media, all the media industries are transforming simultaneously.

Digital Media Support Convergence

In 1978, Nicholas Negroponte at the Massachusetts Institute of Technology was the first to identify a theory called ***convergence***. This theory gave a name to the process by which the various media industries in the late 1970s were beginning to intersect, and MIT was among the first places to foresee and identify this trend. (See **Illustration 9.1**, "The Evolution of Today's Convergence: 1978 to 2016," p. 175.)

The media industries not only were combining economically, as media companies began to buy and sell each other, but the technology of the industries also was merging, according to MIT. This convergence meant that eventually the products the media companies produced began to interact with each other.

Negroponte also said that the combination of the traditional media industries with the computer industry would create a new type of communication.

To identify what was happening to the media industries, Negroponte created two models to show the position of the media industries in 1978 and his projected vision for those industries in the year 2000. He listed three segments of the media business: (1) print and


The Internet offers people mobile media access just about wherever and whenever they want it, including in their cars. Because of the distractions it causes, many states have made texting while driving illegal.

Tony Avelar/The Christian Science Monitor/Getty Images

Compatible   Media that can function well with one another to exchange and integrate text, pictures, sound and video.

Convergence   The melding of the communications, computer and electronics industries.

IMPACT

Convergence

The year
1978

The year
2000

The year
2016
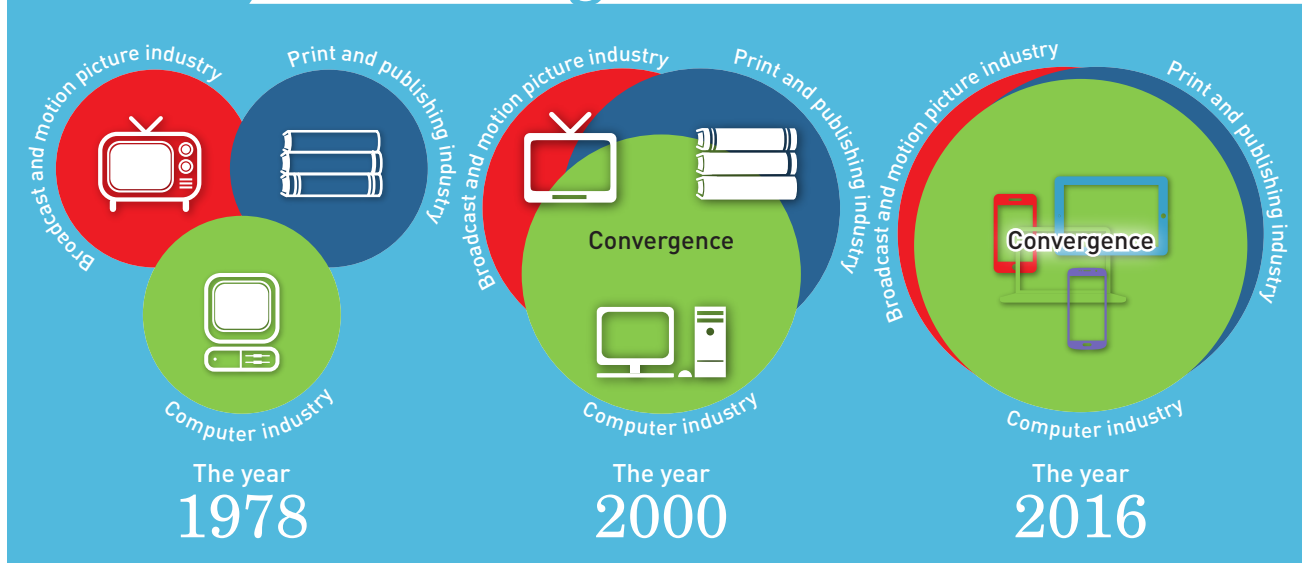
© Cengage Learning 2015

ILLUSTRATION 9.1

The Evolution of Today's Convergence: 1978 to 2016

The diagram on the left displays the alignment of the mass media industries

in 1978, showing each media industry with very little overlapping territory. The middle diagram shows what MIT's Nicholas Negroponte predicted would happen by 2000, with the three types of industries—broadcast/motion pictures, printing/publishing and computers—merging further.

The 2016 diagram shows what convergence looks like today. Because of digital computing technology, all three media segments have completely intersected. Printing/publishing and broadcast/motion picture products are available to consumers across all types of media devices.

publishing, (2) broadcast and motion pictures and (3) the computer industry.

The first diagram in Negroponte's model displays the alignment of the media industries in 1978, which shows them with a small amount of integrated territory. In the second diagram, which shows Negroponte's predictions for the year 2000, the three segments of the media industries completely overlap. Negroponte's forecast was a very accurate prediction, and it helped establish the framework for today's thinking about the Internet.

This early economic and technological convergence in the media industries is the most important reason for the development of today's digital media. By the year 2000, every media industry was equally well positioned to take advantage of new developments, and today every media industry benefits from convergence.

Wide Web possible. The person most responsible for the World Wide Web is Tim Berners-Lee, a British native with an Oxford degree in physics. Working in 1989 in Geneva, Switzerland, at the CERN physics laboratory, Berners-Lee created several new programming languages.

One of these new computer-programming languages was ***HTML*** (hypertext markup language). Hypertext transfer protocol (***HTTP***) allowed people to create and send text, graphics and video information electronically and to set up electronic connections (called ***links***) from one source of information to another. These developments were very important in the Web's early days, and today people who use the Internet don't even need to know the programming language that made the Web possible.

20th-Century Discoveries Made Internet Possible

Several technological developments were necessary for people to be able to share text, graphics, audio and video online. These developments made the creation of the World

HTML   Hypertext markup language.

HTTP   Hypertext transfer protocol.

Links   Electronic connections from one source of information to another.

British computer scientist Tim Berners-Lee invented the World Wide Web and gave the Web its name. Berners-Lee gives a presentation at the Palace of Westminster, London, on February 5, 2015.

After he invented the language and mechanisms that would allow people to share all kinds of information electronically, Berners-Lee gave this invention its name—the World Wide Web. "The original goal was working together with others," says Berners-Lee. "The Web was supposed to be a creative tool, an expressive tool." Berners-Lee also created the first **browser**, which allows people to search electronically among many documents to find what they want.

Today, Berners-Lee still is involved in the Web's development, as founder of the World Wide Web Foundation, which promotes access to the Web throughout the world. "When you think about how the Web is today and dream about how it might be, you must, as always, consider both technology and people," says Berners-Lee. "Future technology should be smarter and more powerful, of course. But you cannot ethically turn your attention to developing it without also listening to those people who don't use the Web at all, or who could use it if only it were different in some way. The Web has been largely designed by the developed world for the developed world. But it must be much more inclusive in order to be of great value to us all."

Marc Andreessen and his colleagues at the University of Illinois further defined the browser, and in 1994 they introduced software called Mosaic, which allowed people to put text and pictures in the same online document. Some of the successors to Mosaic are Safari, Mozilla, Google Chrome, Firefox and Internet Explorer, which are among the most widely used commercial browsers.

Another level of help for Web access is the **search engine**. This tool locates information in computer databases. Two familiar search engines are Google and Yahoo! These systems turn your typed request for information into digital bits that then search for what you want and return the information to you. Yahoo!, founded in 1995 as a search engine company, today makes money through subscriptions, advertising and classified ads and employs more than 8,000 people around the world. Google Inc., which has more than 50,000 employees, celebrated its 15th anniversary in 2013. Launched by entrepreneurs Larry Page and Sergey Brin in 1998 with four computers and $100,000, Google Inc. is now worth more than $370 billion.

To encourage people to use their systems, both Berners-Lee and Andreessen placed their discoveries in the **public domain**, which means that anyone with a computer and a modem can download them from the Internet and use them for free. *This culture of free information access, coupled with a creative, chaotic lack of direction, still permeates the Web today.*

The process of putting documents on the Web drew its terminology from print, the original mass medium. That's why placing something on the Web is called **publishing**, and the publication begins with a **home page**, the front door to the site—the place that welcomes the user and explains how the site works. However, even though Web sites are similar to published documents in the way they work, what is created on the Web has few of the legal limitations or protections that apply to other published documents. (See **Chapter 14**.)

Web Opens to Unlimited Access

Once Tim Berners-Lee had created the tools for access so that all types of text and video images could become available on the Web, it was left to anyone who could use the tools to create whatever they wanted and make it available to anyone who wanted it.

"Nobody ever designed the Web," says Canadian sociologist Craig McKie, who maintains his own Web site. "There are no rules, no laws. The Web also exists without

Browser Software that allows people to display and interact with information on Web pages.

Search Engine The tool used to locate information in a computer database.

Public Domain Publications, products and processes that are not protected by copyright and thus are available free to the public.

Publishing Placing items on the Web.

Home Page The first page of a Web site, which welcomes the user.

Companies are using today's emerging technologies to create new products like the Apple Watch, introduced in 2015, which they hope the public will embrace.

Media and computer entrepreneurs try to capitalize on fast-moving developments to be the first to deliver new creative products that large numbers of people will want to use, and society struggles to adjust to the access to communication that new products create.

There are many parallels between the development of the Internet and the early history of traditional media, such as movies. Like traditional media, today's emerging technologies are being used to try to create new popular products that the public will crave.

In the early 1900s, when movies first were introduced as flickering images on a small screen, the moving images were something consumers hadn't seen before, but many people thought the silent movies were just a passing fad (see **Chapter 7**). The inventions Thomas Edison and his colleagues introduced at the time made the movies technologically possible, but the movies also needed creative minds like director D. W. Griffith and stars like Mary Pickford to create epic stories that people wanted to see. When new inventions brought sound to the movies, the success of the new medium was unstoppable.

This combination of technological development, creative expression and consumer demand was crucial for the movies' enduring prosperity. The same collision of economics, technology and creativity that drove the early days of the movie industry is behind today's race to develop digital media.

national boundaries." Any type of information—video, audio, graphics and text—can travel virtually instantly to and from anyone who has a computer and access to the Internet anywhere in the world.

Universal access, limited only by the available technology, is what gives the Web the feeling and look of what has been called "anarchy"—a place without rules. The Web is a new medium, but its growth as a true *mass medium* for people seeking information and entertainment is limited only by digital technology and economics. Large media companies have huge amounts of money available to bankroll new technologies. These companies also have a shared interest in seeing their investments succeed. So convergence is continuing at a very rapid pace, which is the main reason new digital media products are being introduced so quickly.

Some of the digital media products that flood the marketplace succeed; many do not. However, the potential reward if consumers adopt a digital media product is so large that all types of media companies are willing to take the risks associated with developing new products. For consumers, this means an array of products bombarding the marketplace simultaneously, such as the Apple Watch.

When newer forms of media emerge, older media systems evolve and adapt. However, discarded electronic gear like this pile of old computers and TV sets in Philadelphia poses a challenge for recyclers.

What Happens to Old Media?

How does the development of digital media affect older, traditional media? Some scholars have predicted, for example, that print media are dead, yet book sales continue to be steady, and publishers have developed e-books to take advantage of the digital form. The history of the evolution of media shows that the introduction of a new medium or a new delivery system does not mean the end of the old. The continuous expansion of the media industries during the 20th century demonstrates this evolution.

When television was introduced, for example, radio did not disappear. Instead, radio adapted to its new place in the media mix, delivering music, news and talk. Today, radio exists alongside television. Movies, which also were threatened by the introduction of television, responded by delivering more spectacular and more explicit entertainment than people could see on television, and today movies still play an important role in the business of media.

"When newer forms of communication media emerge, the older forms usually do not die—they continue to evolve and adapt," says Roger Fidler. The different media compete for the public's attention and jockey for positions of dominance, but no medium disappears. Instead, each medium contributes to the development of its successors. Together, all media that now exist will contribute to media forms that are yet to be invented.

Transformation Takes 30 Years

Just how quickly consumers adopt new technologies is predictable, according to Paul Saffo, former director of the Institute for the Future in Menlo Park, Calif. Saffo theorizes that for the past five centuries the pace of change has always been 30 years, or about three decades, from the introduction of a new technology to its complete adoption by the culture.

Saffo calls his theory the ***30-year rule***, which he divides into 3 stages, with each stage lasting about 10 years. In the first stage, he says, there is "lots of excitement, lots of puzzlement, not a lot of penetration." In the second stage, there is "lots of flux, penetration of the product into society is beginning." In the third stage, the reaction to the technology is, "Oh, so what? Just a standard technology and everybody has it." By Saffo's standard, American society is in the third stage of acceptance of online technology. Widespread consumer use of

AP Images/John Shearer

Even though Internet access is everywhere in America, 21 percent of the U.S. population still has never gone online. The gap between people who use the Internet and people who don't is called the **digital divide**. *Furious 7* star Dwayne Johnson takes a "selfie" on a mobile phone with fans at the film's premiere in Los Angeles on April 1, 2015.

the Internet started to grow beginning in 1988, when less than one-half of 1 percent of the U.S. population was on the Internet. Today, 79 percent of the U.S. population is online.

Saffo's description of the third decade of acceptance coincides with the adaptability of today's media marketplace. New media are more familiar, and people seem better able to incorporate combinations of new and existing media technologies. The digital technological transformation is a commonly accepted part of everyday life.

Web Access Leaves Some People Behind

The initial sign of the expansion of the Internet to consumer and educational users in the first decade of change—the early 1990s—was the adoption by businesses and private users of electronic mail, or ***e-mail***, technology. With a computer, a modem and a telephone line, just about anyone could learn how to communicate electronically online.

"The driving force for achieving large subscriber gains is the incorporation of the Internet by consumers as part of their routine," according to Veronis Suhler

30-Year Rule Developed by Paul Saffo, the theory that it takes about 30 years for a new technology to be completely adopted within a culture.

E-mail Mail that is delivered electronically over the Internet.

Stevenson, a media research company. "The Internet has become a tool that allows users to economize on what has become their scarcest resource—time. Virtually all of the leading Internet applications allow users to accomplish tasks more quickly than they can through alternative means."

E-mail and text messaging at school, work or home still are how most people first experience communicating in an electronic environment. Just as telephone answering machines in the 1970s changed voice communication by allowing people to send and receive messages on their own time schedule, e-mail and text messaging allow people to communicate and receive information at their convenience.

E-mail and text messaging are easy-to-use, text-based systems, which means that people type in messages on a keyboard, which is a familiar tool. Familiarity and convenience are very important in the adoption of new technologies because people's fear of something they don't understand and misunderstandings about how new technologies work can keep them from changing their established habits.

Yet, according to the Pew Internet and American Life Project, one out of five American adults says he or she has never used the Internet or e-mail and does not live in an Internet-connected household. Some people don't use the Internet because they can't afford it or they're afraid to try it or they don't have access. People living with a disability also are less likely to go online. This gap between people who have Internet access and those who don't is called the ***digital divide***.

Pew calls these people "truly disconnected adults"—typically people who have less than a high school education, are over 65, or live in a rural area. "If they needed to get information from a Web site or other online source, they probably could not easily do so," says Susannah Fox, associate director of the Pew Internet Project.

Pew says that the main reason adults give for not going online is that "they don't think the Internet is relevant to them. Most have never used the Internet before, and don't have anyone in their household who does."

For children, the great equalizer is public education. Access to computers in the classroom guarantees they will be comfortable with the technology as they grow up. Mature adults and rural populations without access to the technology can be disadvantaged unless government institutions, such as public libraries, close the gap.

Courtesy of Shirley Biagi
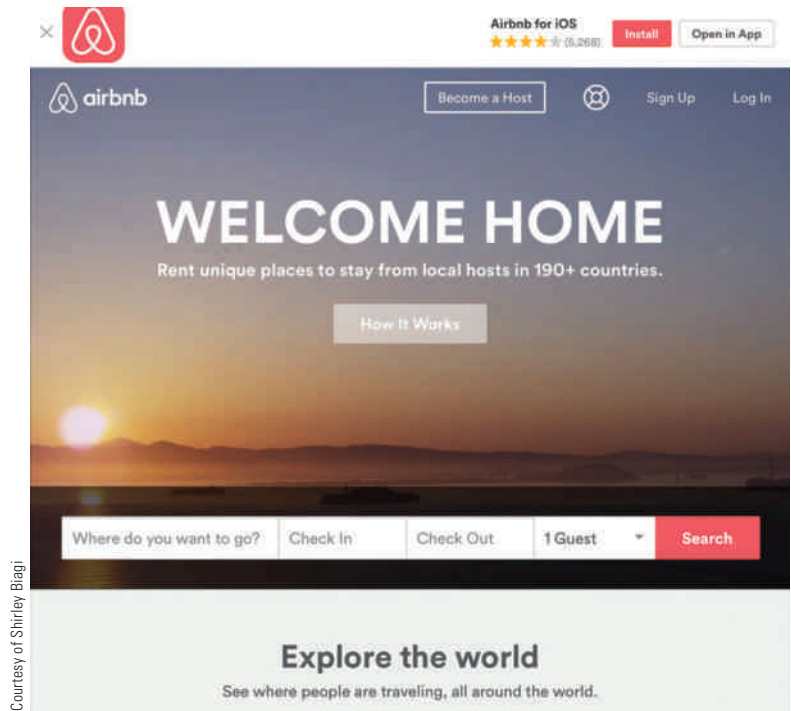
The Internet offers consumers access to a worldwide array of products and services, which has changed the way many people shop and plan their travel. The Web site airbnb.com, for example, allows travelers to connect with people who want to rent out extra rooms in their homes for vacation stays all over the world.

Internet Combines Commerce, Information and Entertainment

What makes the Web as a mass medium different from traditional media is its capacity to combine commerce with access to information and entertainment. Not only can people buy products on the Web, but they can also learn new things and enjoy themselves.

Most people use an Internet service provider (***ISP***, also called an Internet access provider), such as a telephone, satellite or cable company, to organize and deliver Internet information and entertainment. Today, a major source of Web income is the money people pay their ISP to connect to the Web. There are three other potential sources of income on the Web: commerce (connecting sellers with potential buyers), advertising and content.

Commerce

"Millions of Internet users are forsaking yard sales and the local dump for the prospect of selling their

Digital Divide The gap between people who have Internet access and those who do not.

ISP Internet service provider, also called an Internet access provider.

hand-me-downs and unwanted gear online," according to a report by the Pew Internet and American Life Project. "About one in six Internet-using adults have sold something online." This recent success of the Internet as a way for people to buy and sell things is only one example of the Internet's potential as a marketplace.

The most resilient commercial Internet operation is Amazon. It began as a place where people could buy media products such as books, CDs and DVDs, but today consumers also can shop on Amazon for just about anything—clothes, cosmetics, cars and sports equipment, for example—often at discount prices from individuals as well as large retailers, such as Target. Amazon has grown into a vast international Internet department store.

Small retailers and individuals also can use the Web to sell products directly, without setting up a store or spending a lot of money on expensive advertising, on *eBay*, a Web site that began about 25 years ago as a place where individual sellers offered products—mostly collectibles—in an online auction atmosphere.

Today, eBay is another vast marketplace where individuals sell collectibles, but eBay also promotes direct consumer-to-consumer sales for products as varied as cars, houses, even used jeans. Most individual sellers on the site do not have retail stores. Their only outlet is eBay, yet the Internet gives eBay sellers access to buyers all over the world.

Convenience, reliability and affordability sustain both these Web sites as successful commercial ventures— two

examples of new types of businesses that thrive because of the Internet.

Advertising

When television was introduced to the public in the late 1940s, people assumed from the beginning that it would be a commercial medium—that is, advertisers who bought the commercials surrounding the programs would pay for the programming. This concept of using advertising to underwrite TV programs was a natural evolution from radio, where commercials also paid for the programming.

Advertisers follow the audience, so as consumers have migrated to the Web, advertisers have tried to figure out how to follow them. Advertising is the second potential source of income on the Web.

Most commercial Web sites now carry some form of advertising. These appear as banners across the top of the Web site or run as borders alongside the site's pages. But just as in traditional media, advertising can crowd out the original message and turn away consumers, and entrepreneurs continue to test the market to develop new Web advertising structures and designs that will pay the bills. (See **Illustration 9.2**, "How Much Do Businesses Spend Annually to Advertise on the Internet?," p. 181.)

Because the Web is such a targeted medium—the seller can gather a lot of information about the buyer— the Web holds better potential for monitoring consumers' buying habits than traditional methods of advertising. Ultimately, Web advertisers hope to "achieve the merchandiser's dream—targeting an audience far more precisely than it can with either newspapers or television by advertising a product only on sites that draw people likely to be interested in that product," says media critic David Shaw, with "nearly instantaneous electronic feedback on whether their ads are effective: How many people saw the ad? How many 'clicked' on it and went on to a more detailed presentation? How many bought the product right then, online?"

Internet "tracking" offers advertisers information about their audiences. Commercial sites offer advertisers information about how many "hits" the sites receive— how many times people look at the site and how much time they spend. This information-gathering is so sophisticated that the data can even show an advertiser which specific user bought which specific products that were advertised on a specific site.

Companies also have developed "ad robots" that allow a business to, in effect, eavesdrop on chat room conversations while the user is online. If someone mentions a car problem online, for example, the robot recognizes the pattern of words in the discussion and sends the person an ad for the car repair shop.

Always looking for new ways to target specific audiences, advertising agencies also offer services such as

In the year 2030.

John McPherson/Cartoonbank.com

IMPACT

Money

Amount Spent in Billions

$51
2015

$37
2012

$23.1
2008
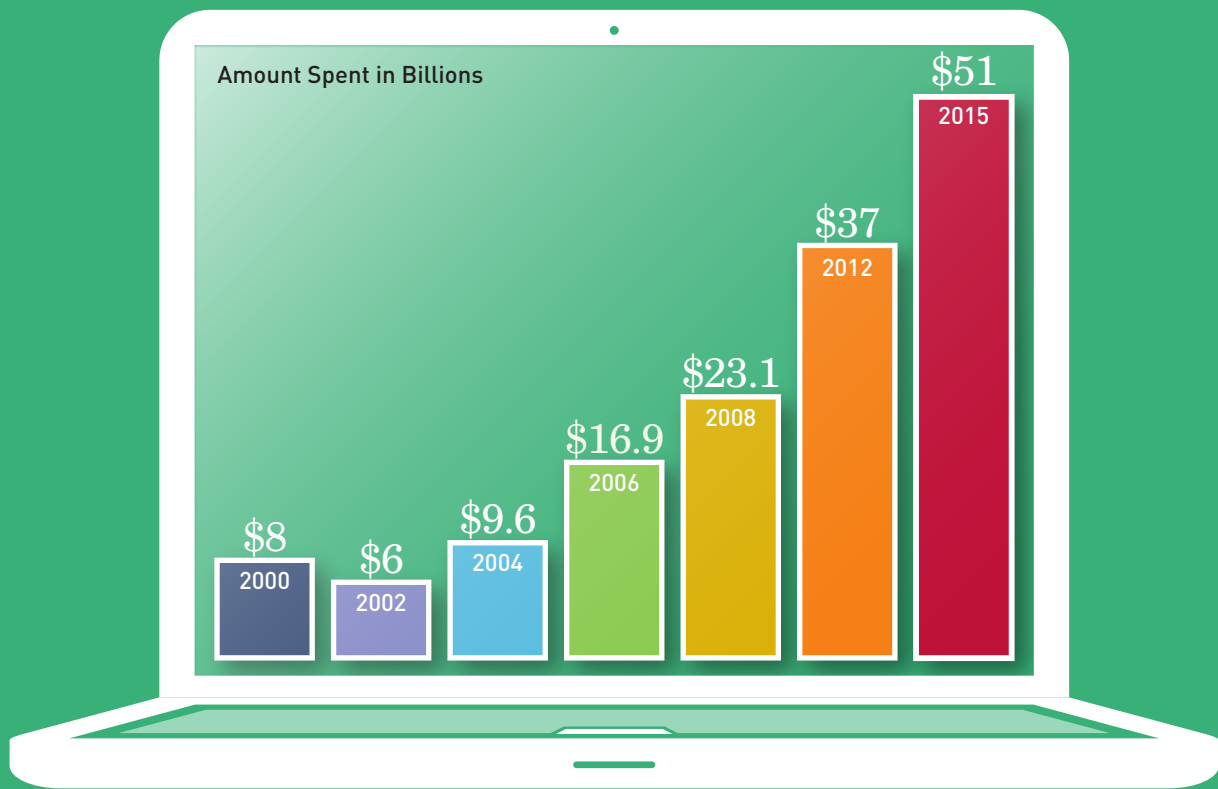
$16.9
2006

$9.6
2004

$8
2000

$6
2002

ILLUSTRATION 9.2

How Much Do Businesses Spend Annually to Advertise on the Internet?

Since 2000, advertisers have been racing to reach consumers by advertising products and services on the Internet. The amount that companies spent to advertise on the Internet in 2015 is more than five times what they spent in the year 2000.

Advertising Age 2015 Marketing Fact Pack, adage.com/datacenter, December 29, 2014.

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search marketing, which means placing client ads next to consumers' Internet search results so that when someone starts a search for SUVs, for example, the SUV car manufacturer's ad immediately appears on the screen next to the user's search results. Appearing within the SUV ad, of course, is a link to a Web site where the user can customize and order a car. By connecting consumers directly to advertisers, search marketers say, they can better trace and document the connection between Internet ads and their audiences, something many advertisers are demanding before they invest in the Internet audience.

Ad robots and search marketing are just two examples of the refined tools advertisers have developed to more accurately track and target the Internet consumer.

Content

The culture of the Web began with the idea that content would be available free, so it has taken a long time for consumers to embrace the idea that they should pay for media content on the Web.

Slate, the online literary magazine, tried to start charging subscribers in 1997, but then decided against it. Editor Michael Kinsley said, "It would be better to establish a brand name with wide readership first." *Slate* celebrated its 20th anniversary in 2015 and still does not charge subscribers.

Some explicit Web sites charge for access, and some news and information sites, such as *The Wall Street Journal*, charge subscribers an annual fee for access to archived online content older than seven days—beyond

> **Search Marketing** Positioning Internet advertising prominently next to consumers' related online search results.

what's available free on the main *Journal* news site. *The New York Times* began charging for access to its site in 2011. Other sites, such as the sports network ESPN, give away some information and then charge for "premium" services. Internet gamemakers, who offer video games on the Web, charge by the hour or use a tiered pricing structure—free, basic and premium.

In 2003, consumers showed they were willing to pay for music downloads when Apple founder Steve Jobs introduced iTunes, a music service for subscribers that allows people to download popular songs for a fee. Less than a year after its launch, iTunes celebrated its one-billionth music download.

In 2010, when Apple introduced the iPad, an electronic tablet offering many more functions than its predecessor from Amazon (the Kindle), Apple sold 500,000 iPads in the first week. Tablet devices offer another mobile outlet for purchased media, such as books, newspapers and magazines. Downloads of a currently popular book sell for about $5 to $15, bringing a new source of revenue for book publishers and authors.

Another major source of revenue generated by the Internet comes from the development and sale of video games. The video game industry is a hybrid that combines equipment (such as Xbox and PlayStation), software and Internet downloads. According to the Entertainment Software Association, computer and video gaming generated nearly $60 billion worldwide in 2014. The average game player is 30 years old and has been playing video games for 12 years. (See **Impact/Global**, "Can Video Games Be a Force for Good?," p. 183.)

Originally appealing to younger consumers, with war games for young adults and animated products for children, today's video game companies recently broadened their audience significantly by producing nonviolent kinetic games. "The industry is saying we care about hard-core fans, but we have to go after the wide audience," says Brian Crescente, editor in chief of gaming Web site Kotaku. The shift is also economic—a way to escape the industry's reputation for exploiting violence by producing only "shooter" games and to avoid government attempts to control video game content and distribution.

Mobile Media Chase the Audience

Internet receivers have grown smaller and smaller, and retailers have expanded their ads to mobile phones and tablets. Much like radio broadcasters who followed radio

ullstein bild/Getty Images

Web developers cater to mobile media users because they are such a big audience. Consumers shop at a Vodafone mobile media store in Munich, Germany.

listeners from their homes into their cars when car radios were invented, Web site businesses are chasing today's mobile consumers.

The nation's millions of cell phone and tablet users make mobile media consumers an inviting target. Consumers use mobile media to send text messages, take pictures, search the Internet and buy products. This makes smartphones and other mobile media devices extremely attractive media markets. (See **Illustration 9.3**, "How and Where Do People Use Mobile Media?," p. 184.)

Mobile media content has restrictions—content must be audible and clearly visible in the smaller viewing space of a cell phone or tablet screen. News and sports bulletins, short video clips and social media are perfectly suited for this media environment.

All four of the major TV networks and most subscription channels now offer most of their entertainment programs and news video online, on demand, for computer, cell phone and tablet viewing.

Social Networks Grow Globally

A **social network** is an Internet community where people share information, ideas, personal messages, photographs, audio and video. Mobile applications (**apps**)

> **Social Network** An Internet community where users share information, ideas, personal messages, photographs, audio and video.
>
> **App** Mobile application.

IMPACT

Global

Can Video Games Be a Force for Good?

By Edward Helmore

A decade ago Asi Burak developed a video game designed to encourage opposing parties in the Israel-Palestine dispute over land to better understand—even empathize with—each other's point of view. That conflict may be no closer to a resolution, but the concept that interactive games can be used for more than mere entertainment, even as a tool for positive change, is looking like the next big thing in online gaming.

[In April 2014] Burak's 11th annual Games for Change Festival [joined] forces with New York's prestigious Tribeca Film Festival in an effort to give video games greater recognition and counter the stereotype that this £39bn global industry can specialize only in war games, urban chaos and medieval fantasy.

"People understand that games are powerful, but they're also scared of this power," says Burak. "We need to change the perception that all games are shallow, violent and childish, because they are not."

Statistics show that gaming has outgrown its reputation as an activity for children and teenagers. The average age of players is now 30, 10 years older than it was a decade ago.

There are games for women in their 30s, and games for seniors to combat declines in mental function.

Collectively, the world now spends one billion hours every

Some video game developers are trying to counteract the stereotype that all video games are shallow, violent exercises. Child gamers participate in a *Minecraft* tournament in Ascot, England, on August 9, 2014. *Minecraft* has been cited as a creative, nonviolent alternative video game for children.

Miles Willis/Getty Images

day playing video games—up more than 50% in three years. Meanwhile, the average young person racks up 10,000 hours playing video games by the age of 21, only slightly less than the time they spend in secondary education.

"People see the negative side and they talk about addiction, but there are many games on the positive side," says Burak. Games such as *Minecraft*, he adds, are "amazingly creative experiences and far more engaging than watching TV."

Many of the new studies claim a wide variety of benefits from gaming, including improved attention, higher creativity and improved ability to manage difficult emotions, such as fear and anger.

The technology poses as many questions as it answers. If virtual-reality games connect us to the real world, what does that say about our

lack of connection? Are video games a source of "real" happiness? Do the positive emotions contribute to real wellbeing, or are these feelings also virtual?

Philosopher Bernard Suits, author of *The Grasshopper: Games, Life and Utopia*, claims that, if we ever create a perfect society, games will be the only reason to go on living. We would have to play, or else have no purpose in our lives, Suits argues, because they can bring a sense of service and collective meaning.

Like real-world reality, there is no single virtual reality, says Burak. It's an open debate. Some want to use virtual reality for behavioral change; some to make political statements.

But, speaking personally, he adds: "I would like to see more design purpose and effort going towards creating empathy."

Excerpted from Edward Helmore, "Ethical Gaming: Can Video Games Be a Force for Good?" April 12, 2014, theguardian.com.

IMPACT
Society

Where People Use Mobile Media

Waiting for something — 83%

Lying in bed — 81%

Watching TV — 61%

Commuting — 57%

Spending time with family — 51%

At social gatherings — 46%

Shopping — 43%

In the bathroom — 27%

In a meeting or class — 25%

How People Use Mobile Media

General information and search — 84%

Social media — 84%

Games — 83%

Entertainment — 77%

E-mail — 76%

Local search — 69%

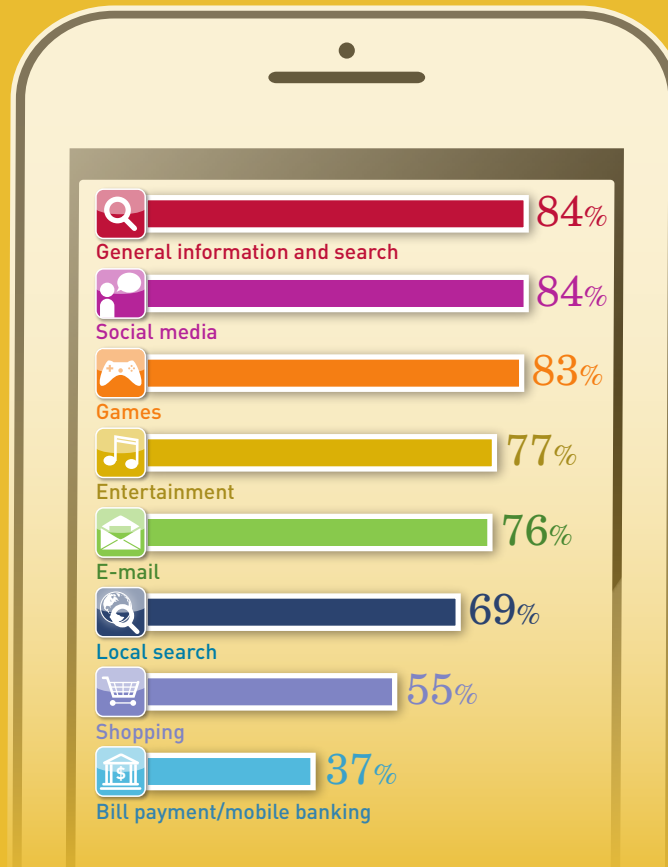Shopping — 55%

Bill payment/mobile banking — 37%

ILLUSTRATION 9.3

How and Where Do People Use Mobile Media?

Mobile media is the fastest-growing area of consumer media use. **Consumers spend more** time using mobile phones **(97 minutes) than watching TV (81 minutes), and 61 percent of mobile Web users engage in mobile activities *while* watching TV**, according to InMobi, a mobile advertising company.

"Wave 3: Global Mobile Media Consumption: A 'New Wave' Takes Shape," February 2014, www.info.inmobi.com; "5 Ways Mobile Devices Have Changed the Way Americans Consume Media," August 16, 2012, www.info.inmobi.com.

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make social network connections, such as Facebook, available to anyone with a mobile phone, anywhere in the world.

Social networks enable anyone who wants to create a podcast or a blog or a personal Web space to share information and ideas and, most often, to stay in touch with friends and family.

PODCASTS. Podcasting is the distribution of an audio or video file online. Individuals can easily use the Internet to create and share *podcasts*, and many news organizations, such as *PBS* and *The New York Times*, frequently add podcasts to their Web sites as a way to expand coverage.

There also are podcast networks that feature several shows on the same feed, similar to a radio station.

Podcast An audio or video file made available on the Internet for anyone to download, often by subscription.

Consumers can download podcasts and listen to them whenever and wherever they want, which also makes podcasts an easy way to reach a mobile audience.

BLOGS. By one estimate, 80,000 new blog sites are launched daily. The blog search engine Technorati tracks 29 million blog sites. A ***blog*** (short for Web log) is an online discussion group where people can post comments about a topic in a running conversation with each other.

Many news sites post live blogs to cover breaking news events. When Hurricane Sandy hit the East Coast in October 2012, several newspapers began blogs that invited people involved in the storm to contribute photos and news from their affected areas, as events were happening.

The text of the blog runs in reverse chronological order, with the most recent comments posted at the top of the blog so people can read through the previous postings for background on the topic, or they can start reading what follows after they join the group. Typically blogs do not carry advertising and are created as a way to enhance other content on the Web.

Blogs also have become frequent sources of information for news organizations seeking public reaction to ongoing events. The 2004 presidential election was the first time bloggers actually were accredited as part of the presidential press corps, indicating the importance of the bloggers' role as commentators on topical issues.

SOCIAL MEDIA SITES. In its report *Why Americans Use Social Media*, the Pew Internet and American Life Project said that 91 percent of adults use social media sites to stay in touch with current friends. Facebook and Pinterest are among the most popular social media networks, but several competitors have emerged, such as Pinterest and LinkedIn. In 2012, Facebook reported the Web site had reached 1 billion monthly users. (See **Illustration 9.4**, "Why Do People Use Social Media?" and **Illustration 9.5**, "Which Social Media Sites Are Most Popular?," p. 186).

Users create a personal page, a short blog for personal messages, plus they can add photos and video. Some sites, such as Facebook, are ad-supported; subscription fees for upgrades support others, such as LinkedIn.

Podcasts, blogs and social media sites are the latest ways the media business has expanded its audience. It's important to remember that, in the history of the media business, advertisers always have followed consumers. To be successful, Internet providers know they must attract customers to be able to capitalize on the advertising potential the audience brings with it.

Government Attempts to Coordinate and Control the Net

The federal government has attempted to coordinate and regulate the Internet in the same way government traditionally coordinated and regulated the broadcast media in its early days. However, the U.S. government has learned the hard way that it can exercise only limited control over the Internet, especially its content.

In 1994, in its first attempt to coordinate the growing presence of the Internet, the U.S. Congress named the effort to coordinate the nation's various senders, channels and receivers in the United States the National Information Infrastructure (***NII***). This congressional intervention in the structure of the Internet was based on the history of radio and TV in the United States, which the government had regulated since the 1920s.

Three principles guided the creation of the nation's telecommunications structure, Congress said:

1. Private industry, not the government, would build the digital network.

2. Programmers and information providers would be guaranteed access to the digital network to promote a diversity of consumer choices.

3. Steps would be taken to ensure universal service so that the digital network did not result in a society of information "haves" and "have-nots."

Then two years later, in its first attempt to control Internet content, Congress passed the Telecommunications Act of 1996. Included in that legislation was the Communications Decency Act (***CDA***), which outlined content that would be forbidden on the Internet. As soon as the act passed, civil liberties organizations challenged the law, and in 1997 the U.S. Supreme Court upheld the concept that the U.S. government could not control Internet content.

Although the U.S. government has retreated from its attempts to control Internet content, central governments in many countries control Internet access through ownership and/or regulation of the utilities that carry Web signals. Government control affects the free flow of information globally and, in turn, affects Internet users in the U.S. Any government interference with Internet traffic can result in periodic or permanent blocks on users' Web access and poses security concerns for global Internet providers, such as Google Inc., based in the U.S. In December 2014, for example, the Chinese government

Blog Short for Web log. A running Internet discussion group, where items are posted in reverse chronological order. Blogs usually focus on a specific topic.

NII National Information Infrastructure.
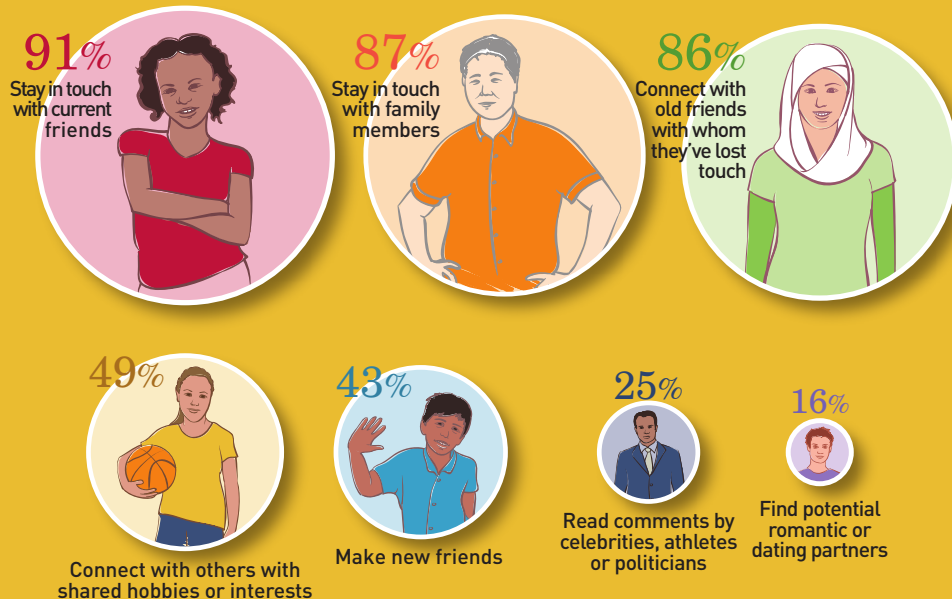
CDA Communications Decency Act.

IMPACT

Society

Why Do People Use Social Media?

Most adults use social media to stay in touch with friends and family, but there are several other reasons people visit sites such as Facebook, Twitter and LinkedIn. People use social media to:

91% Stay in touch with current friends

87% Stay in touch with family members

86% Connect with old friends with whom they've lost touch

49% Connect with others with shared hobbies or interests

43% Make new friends

25% Read comments by celebrities, athletes or politicians

16% Find potential romantic or dating partners

Pew Internet and American Life Project, www.pewinternet.org.

Which Social Media Sites Are Most Popular?

Today 52 percent of online adults use two or more social media sites. Facebook is the most popular social media site, but Instagram is more popular among young adults ages 18–29. Here is the overall percentage of American adults who use the following sites:

Facebook 58%

LinkedIn 23%

Pinterest 22%

Instagram 21%

Twitter 19%
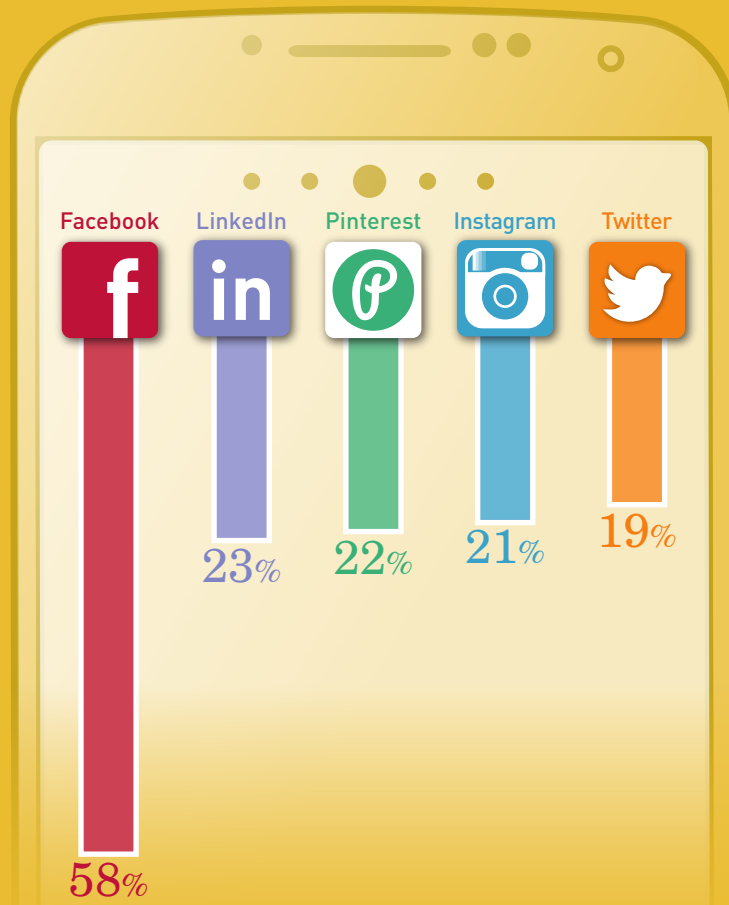
Pew Research Center, "Social Media Update 2014," January 9, 2015.

allegedly blocked Google Inc.'s e-mail service within the country. (See **Impact/Global**, "Chinese Access to Gmail Cut, Regulators Blamed," p. 188.)

Protection Sought for Intellectual Property Rights

Money is the main reason the federal government continues to be involved in the global development of the Internet—to protect the commercial value of Internet products. Digitized bits, once they are widely available, can be easily stolen and reproduced for profit, which can mean billions of dollars in lost revenue for companies and individuals who produce media content and the tax dollars that generates. Writers, moviemakers, singers, TV producers, Web site developers and other creative people who provide content for the media industries are especially concerned about their ideas being reproduced in several different formats, with no payment for their property.

This issue, the protection of what are called *intellectual property rights*, is a crucial part of the U.S. government's interest in the design of the Internet as a communications network. To protect online content, various copyright holders have used court challenges to establish their legal ownership, but some groups still are trying to avoid detection by keeping their online activities hidden from government scrutiny.

With access to copyrighted digital content, someone could capture video from a Disney movie sent over the Internet and join sections of that video with comedy bits from an episode of *Saturday Night Live*, putting the two casts together in a newly digitized program, for example. Once this content is captured and stored, it would be available to anyone who wants to use it.

The protection of content is one of the dilemmas created by digitized files that can be transmitted to anyone's storage system over an international network. The creative people who contribute this content, and the people who produce and own these programs, are demanding laws and regulations structured to protect intellectual property rights.

The issue of who owns existing copyrighted material, such as recordings and movies, is particularly complex on a medium like the Internet with global access and few international controls. In 1998, Congress passed the Digital Millennium Copyright Act (***DMCA***) to make it illegal to share copyrighted material on the Internet. (For more information about the DMCA, see **Chapter 14**.) Using this law and provisions of existing copyright law,

John Klossner The New Yorker Collection/The Cartoon Bank

industries with a big stake in content ownership have sued to stop people from sharing copyrighted content on the Internet.

The Recording Industry Association of America (***RIAA***) and the Motion Picture Association of America (***MPAA***) have been especially aggressive in seeking to prosecute people who make copyrighted content available on the Web. In 1999, RIAA sued Napster, a company that provided a music-swapping service on the Internet. In 2001, after several appeals, the courts found that Napster was liable for "vicarious copyright infringement." Napster eventually shut down and then reopened as a subscription music service that pays royalties to companies that own rights to music available on the site.

In 2001, the MPAA sued to stop publication of the digital code that allows a person to copy DVDs and place copies of movies on the Internet. The court agreed with the MPAA, saying that even if people possess the code but don't use it, they are committing piracy. This was an important legal precedent for content sharing on the Web and has led to more corporate attempts to seek wider protections over copyrighted content.

In 2003, Apple launched iTunes, a service that charges a fee to download songs legally. iTunes was created to respond to the various court actions since 1999 and designed to end

> **Intellectual Property Rights**   The legal right of ownership of ideas and content published in any medium.
>
> **DMCA**   Digital Millennium Copyright Act.
>
> **RIAA**   Recording Industry Association of America.
>
> **MPAA**   Motion Picture Association of America.

IMPACT

Global

Chinese Access to Gmail Cut, Regulators Blamed

By Didi Tang, The Associated Press
December 30, 2014, 2:17 a.m.

BEIJING (AP)—Chinese access to Google Inc.'s email service has been blocked amid government efforts to limit or possibly ban access to the U.S. company's services, which are popular among Chinese seeking to avoid government monitoring.

Data from Google's Transparency Report show online traffic from China to Gmail fell precipitously on Friday [December 25, 2014] and dropped to nearly zero on Saturday [December 26, 2014], although there was a tiny pickup on Monday [December 28, 2014].

Taj Meadows, a spokesman for Google Asia Pacific, said Google has checked its email service and "there's nothing technically wrong on our end."

In a Tuesday [December 29, 2014] editorial, the Chinese Communist Party-run *Global Times* newspaper raised the possibility, without confirmation, that the government had cut access to Gmail.

"If the China side indeed blocked Gmail, the decision must have been prompted by newly emerged security reasons," the editorial read. "If that is the case, Gmail users need to accept the reality of Gmail being suspended in China. But we hope it is not the case."

Earl Zmijewski, vice president of data analytics at U.S.-based Internet analysis firm Dyn Research, said his tests showed that China's

A security guard walks by a Google, china, display booth at the Global Mobile Internet Conference in Beijing, China, on April 29, 2015. For three days beginning on December 25, 2014, the Chinese government allegedly cut off Internet service for its Google mail customers, blocking access to the Web. Periodic interruptions in Internet service are fairly common in countries where access to the Web is subject to government censorship.

government had blocked Google IP addresses in Hong Kong used by people on the mainland to access Gmail services.

Calls to the government regulator, the China Internet Information Office, were unanswered Monday [December 28, 2014]. Foreign Ministry spokeswoman Hua Chunying said she did not know about any blockage.

U.S. State Department spokesman Jeff Rathke said in a statement that the development was troubling.

"We continue to be concerned by efforts in China to undermine freedom of expression, including on the Internet, and we believe Chinese authorities' censorship of the media and of certain Web sites is incompatible with China's aspirations to build a modern

information-based economy and society," he said.

Google closed its mainland China search engine in 2009, saying it would no longer cooperate with the country's censors. That followed hacking attacks traced to China aimed at stealing the company's operating code and breaking into email accounts.

Since then, access to Google services has been periodically limited or blocked, possibly in an effort to pressure Chinese users into abandoning Google products and shifting to services from domestic companies willing to cooperate with the government.

Google products are popular among Chinese young people and activists who do not want their email communications to be monitored or intercepted by the Chinese government.

Excerpted from Didi Tang, "Chinese Access to Gmail Cut, Regulators Blamed," Associated Press, December 30, 2014, 2:17 a.m.

illegal ***file sharing***, which means downloading files placed on the Internet by another person, not necessarily the original copyright holder.

In 2005, the music-file-sharing network Grokster shut down after reaching a settlement with the movie and music industries about online piracy. And in 2010, a federal judge ordered the major remaining music-file-sharing service, LimeWire, to shut down its Web site.

In February 2013, the ***Copyright Alert System (CAS)*** in the United States was activated to warn consumers who try to download copyrighted material. Internet companies AT&T, Cablevision, Comcast, Verizon and Time Warner Cable created the system, which notifies offenders when they try to download a copyrighted file. Administered by the Center for Copyright Administration, the system tracks illegal downloaders and, after six warnings, the Internet service provider, such as Comcast, can block the offender's account. (For more information about file sharing, copyright and the U.S. Supreme Court's view of the Internet, see **Chapters 5** and **14**.)

On February 26, 2015, the Federal Communications Commission voted 3-2 in favor of Open Internet rules, or *net neutrality*, which means Internet providers must deliver "open, uninhibited access to legal content" for all their customers. FCC Chairman Tom Wheeler (center) announces the vote with commissioners Mignon Clyburn (left) and Jessica Rosenworcel, who voted with him.

Mark Wilson/Getty Images

FCC Promotes Internet Neutrality

On February 26, 2015, the Federal Communications Commission (FCC) outlined Open Internet rules for Internet service providers that require them to keep their networks open and available to carry all legal content from all carriers. These provisions, often referred to as Internet neutrality (or ***net neutrality***), generally mean that telecommunications companies, such as AT&T and Verizon, must maintain an open network. They cannot restrict access by other providers to their network nor can they limit the type or delivery of content they carry. There are three basic Open Internet rules, as defined by the FCC:

1. No Blocking: Broadband providers may not block access to legal content, applications, services, or non-harmful devices.

2. No Throttling: Broadband providers may not impair or degrade lawful Internet traffic on the basis of content, applications, services, or non-harmful devices.

3. No Paid Prioritization: Broadband providers may not favor some lawful Internet traffic over other lawful

traffic in exchange for consideration of any kind—in other words, no "fast lanes." This rule also bans ISPs from prioritizing content and services of their affiliates.

For consumers, these rules mean, for example, that manufacturers such as Apple cannot require iPhone users to sign up exclusively with AT&T and that people with iPhones and tablets may use any carrier they choose. The rules also mean that a telecommunications company cannot give priority to a high-volume business (Amazon, for example) to deliver its signal at a faster rate than a low-volume customer. All digital signals will travel at the same rate.

The FCC's Open Internet rules place the Internet under regulations that govern the Internet as a utility. In making the announcement about the Open Internet rules, the FCC said the rules "protect and maintain open,

File Sharing   The peer-to-peer distribution of copyrighted material on the Internet without the copyright owner's permission.

Copyright Alert System (CAS)   A government-mandated warning to alert consumers who try to download copyrighted material.

Net Neutrality   Rules for Internet service providers that require them to keep their networks open and available to carry all legal content. Under these rules, providers cannot restrict access to their network by other providers nor can they limit the type or delivery of content they carry.

uninhibited access to legal online content without broadband Internet access providers being allowed to block, impair, or establish fast/slow lanes to lawful content." (See **Chapter 14** for more information about FCC regulation of the Internet.)

Storage, Competing Systems and Security Bring Challenges

International government support for net neutrality is an important issue for the future health of the Internet. The system faces at least three other major challenges: storage capacity, competing delivery systems and system security.

Storage Capacity

The main technological advance that makes today's communications network possible is that electronic systems transform text, audio and video communication into the same type of digital file.

Digital systems theoretically should be compatible, but many places in the world and many media systems have not yet totally converted to the technology that efficient digital delivery requires.

For example, digital delivery requires a huge amount of electronic storage space. To eliminate the need for so much storage, researchers developed a process called **data compression**. A copy of a major movie contains about 100 billion bytes of data. Compression squeezes the content down to about 4 billion bytes.

Data compression makes it much easier for a movie program service to keep movies available for use on demand. This helps make the movie affordable to deliver and usable for customers.

Once the data are compressed, the company that delivers the service also must store the data. The next step in the process is equipment that grabs a movie the consumer has selected from a storage area and delivers it to the customer on request. This transfer equipment is called a **server** because it serves thousands of programs to millions of subscribers, on demand, all at the same time.

A recent innovation in data storage is called **cloud computing**, which allows one business to rent remote use of another company's computer space, operating "in the cloud." In 2011, Apple launched iCloud. Other large companies that can handle massive amounts of data over an online network, like Microsoft and Google, now provide cloud computing to businesses all over the world.

Bloomberg/Getty Images

The latest innovation in data storage is cloud computing. This allows one company to use another company's computer system, transferring information through the Internet to a "cloud"—the second company's secure online network. Video games can be played on the cloud and no longer require separate equipment, such as the Sony PlayStation 4 (PS4) consoles being used at the Tokyo Game Show in Chiba, Japan, on September 18, 2014.

Online video game and gambling sites, media producers and software designers as well as video program providers (TV and cable networks) also are big consumers of cloud computing services.

Data streaming is the most familiar use of cloud computing. With video and audio data streaming, you can begin to play back a file without first completely downloading it. For example, you can start a movie on your laptop and immediately begin watching the film. While you are watching the movie, the file is being downloaded and stored on your computer. With a fast Internet connection, you can even stream live audio and video. Common streaming software brands are Real Audio and QuickTime.

Warehouses called **data farms** house the equipment that feeds the world's digital appetite. Often placed

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Data Compression   The process of squeezing digital content into a smaller electronic space.

Server   The equipment that delivers programs from their source to the programs' subscribers.

Cloud Computing   The remote use by one business of another company's computer space, operating "in the cloud."

Data Streaming   A common type of cloud computing that allows the user to play back an audio or video file without first completely downloading it.

Data Farms   Locations that house data centers for the servers that process data flowing over the Internet.

in remote, rural areas, tens of thousands of data centers throughout the world house millions of massive servers that process the data flowing over the Internet. According to *The New York Times*, these digital warehouses "use about 30 billion watts of electricity, roughly equivalent to the output of 30 nuclear power plants."

The U.S. contains about a third of these data centers, and many of them are running on local power grids, backed up by generators and lead-acid batteries in the case of a power failure. A basic necessity for the Internet's future will be the ability to maintain an efficient energy grid to feed the system's growing data storage needs.

Bloomberg/Getty Images

The transition to global digital delivery faces many barriers, including competition between existing media systems and new technologies. Until all global systems are compatible, digital delivery remains a mix of old and new. At the INTX Internet and Television Expo in Chicago on May 6, 2015, attendees explore the benefits of Comcast's Xfinity X1 Platform.

Competing Delivery Systems

Today's global communications system is a mixture of old and new technologies. The current delivery system is a combination of coaxial cable, copper wire, fiber optics and cellular and satellite technology. Before the new communications network will be complete, new technology must replace old technology throughout the system. Some broadcasters, for example, still send signals over the airwaves with the same technology they have used since the 1930s, when broadcasting was first introduced. This technology is called ***analog***.

Analog technology is very cumbersome because an analog signal needs a lot of space to travel on the airwaves. However, because analog signals travel through the air by transmitters, consumers can receive them free with just an antenna.

At least 10 million homes in the United States still receive only over-the-air analog broadcasts. They do not subscribe to cable or satellite. And although the federal government mandated that TV stations in large cities digitize their signals by 2009, today some smaller stations still have not completed the costly transition to digital.

Cable companies eliminated the need for antennas by using coaxial cable, buried underground or strung from telephone poles, but some coaxial cable systems still use analog technology. Cable operators capture programming, such as HBO, from satellite systems, then gather analog broadcast signals from their local TV stations and deliver this programming to the consumer using a combination of coaxial cable, copper wire and optical fiber.

Optical fiber is composed of microscopic strands of glass that transmit messages in digitized "bits"—zeroes and ones. Each fiber-optic strand carries 250,000 times as much information as one copper wire. A fiber-optics communication system is very efficient because fiber can carry digitized information easily and quickly from one place to another.

Satellite services use digital signals to carry their programming. Programs that are delivered to a home satellite dish follow a wireless electronic journey from the program source through one of the many telecommunications satellites hovering around the globe. Satellite delivery, however, still requires a telephone connection to bring the programs and the menus for the programs to a home receiver.

Telephone companies have converted almost all their major communications delivery systems from coaxial cable and copper wire to fiber optics and cellular technology. However, the incompatibility between analog and digital technology means that any remaining analog signals must be converted first to digital signals so they can

Analog In mass communications, a type of technology used in broadcasting, whereby video or audio information is sent as continuous signals through the air on specific airwave frequencies.

travel smoothly everywhere. Conversion is very expensive.

Digital technology is the most efficient method of delivery, but making the same system available throughout the world with a standardized delivery system is very complex. Each competing system wants to control the entire delivery system because control of the delivery system means billions of dollars in revenue for whichever system consumers eventually adopt.

System Security

With all these different media delivery systems and services available, consumers, industry and government must be able to use them securely. Telephone companies already have a complex system that matches people with the calls they make and carries conversations and texts on secure lines all over the world. To be effective, security for digital communications on the Internet must be at least as safe as current telephone communications.

Commercial operations, such as banks and retailers, have developed secure systems for transferring transaction records on the Internet. To protect consumers' banking records, banks use digital codes and dedicated transmission lines to secure the transactions from Internet hackers. Software companies have developed reasonably reliable systems to ensure that the personal records and content contained in interactive transactions are safe. An entirely new industry has evolved dedicated to the issue of Internet data security.

However, on January 30, 2013, *The New York Times* announced that Chinese hackers had infiltrated its computer systems and obtained passwords for its reporters and other employees. "The attacks appear to be part of a broader computer espionage campaign against American news media companies that have reported on Chinese leaders and corporations," said *The Times*. Officials of the Chinese government denied the charges.

Less than a week later, Twitter reported that hackers had victimized about 250,000 of its accounts, including accounts for President Barack Obama, Vice President Joe Biden and House Speaker John Boehner. On February 12, 2013, President Obama signed an executive order to promote cybersecurity, which encourages the government and private companies to share information about data breaches that threaten national security.

On February 12, 2013, President Obama signed an executive order to promote cybersecurity. On January 13, 2015, at the nation's National Cybersecurity and Communications Integration Center in Arlington, Va., agents monitor digital communications.

Saul Loeb/Getty Images

The rules that individual nations develop to govern the security of this complex global communications network will have a profound impact on individuals, businesses, governments and the media industries.

Disruptive Technologies Revolutionize Old Concepts

The Internet affects consumers daily—how people shop, get their news, study, manage their money and, especially, socialize with friends and family. For businesses, global information is instantly available to most companies simultaneously, making communication much easier but inviting more intense competition.

For the media industries, the Internet places every element of the media business in transition. Today, owners and managers of the companies that make up the media industries are deciding daily how to invest in equipment, employees, research and development to protect current income while trying to ensure their companies adapt to the Internet's evolving demands.

Some digital entrepreneurs succeed, some create transitional products that will, in turn, spark new products, and many new ideas fail. Until the digital media landscape is clearer, however, it is important to follow ongoing developments because no one can predict exactly where digital media are headed. Five ongoing developments to watch that could affect the future of Internet media are: touch technology, massive open online courses (MOOCs), Open Intellectual Property, newsgathering drones and 3-D printing.

Touch Technology

Touch technology uses computing power to digitally enhance the five senses—touch, sight, hearing, taste and smell. Researchers at IBM and other companies are developing a system of cognitive computing, which uses artificial intelligence and advanced speech recognition to make a computer capable of learning.

Scientists say eventually you will be able to simulate the sensation of touch through your cell phone, for example. So when you look at a display of silk sheets on Amazon, you will be able to feel the fabric by touching your cell phone screen. And when an ad for pizza appears on your laptop, it will awaken your taste buds with digital sensors, sending the aroma of tomatoes and cheese and garlic.

Bloomberg/Getty Images

In 2015, CNN announced that it would begin testing camera drones, like this Phantom 2 quadcopter, to help cover news events.

Massive Open Online Courses

Massive open online courses ***(MOOCs)*** create huge online virtual classrooms, available to anyone with an Internet connection. Initially the courses have been offered free through established universities such as Princeton, Columbia and Duke. Typically the courses do not carry academic credit, but the idea is that eventually Internet classes will create a massive virtual university where students can sign up and receive credit for university-approved classes offered anywhere in the world via the Internet.

Three emerging companies, Coursera, edX and Udacity, are promoting MOOCs as an answer to the shortage of classes and increased tuition facing today's students. But there are critics and several unsolved problems. So far MOOCs have a very high dropout rate—nine out of ten students who enroll leave before the class is over. And how can one teacher effectively give grades to thousands of students or verify that the students who are enrolled are the students taking the tests or that they are, in fact, learning the material?

Still, some educators and entrepreneurs are investing in the idea that, for some college courses, a virtual classroom may offer a more efficient, cost-effective alternative to the traditional teacher-student classroom experience.

Open Intellectual Property

Open Intellectual Property is a term used to describe an Internet location where registered users collaborate to create, review and update information on a shared site, commonly known as a ***wiki***. The term *wiki* derives from a Hawaiian word that means "fast." The best-known wiki is

Wikipedia, an online encyclopedia where registered contributors post additions and changes to any entry.

Open Intellectual Property technology records the original material plus the material that contributors add and subtract over time. Wikis have great potential to gather wide-ranging contributions worldwide from all the experts on one subject, for example, but there are very few internal safeguards to guarantee that material placed on the site is secure, accurate or reliable.

Camera Drones for News Reporting

In 2015, CNN signed an agreement with the Federal Aviation Administration (FAA) to begin testing camera drones for use in newsgathering. CNN and the Georgia Institute of Technology announced a joint effort to study how to operate unstaffed aerial vehicles (***UAVs***, commonly called *drones*) to help cover news events.

So far, the FAA has severely limited the use of UAVs for any commercial purpose, but camera drones offer the potential for news organizations to photograph breaking news events, such as earthquakes or fires, that are

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Touch Technology Uses computing power to digitally enhance the five senses—touch, sight, hearing, taste and smell.

MOOCs Massive open online courses.

Wiki An Internet location where registered users collaborate to create, review and share information on a shared site.

UAV Unstaffed aerial vehicle, commonly called a *drone*.

inaccessible from the ground. The FAA has the authority to regulate national airspace, so any newsgathering UAVs used in the U.S. would have to be licensed by the FAA.

3-D Printing

Pioneered by the movie industry in the 1950s, 3-D photographic technology has been adapted by today's moviemakers who can use a new technology called 3-D printing to create special effects characters more efficiently. *3-D printing* uses a large commercial printer, similar to the original small Inkjet printers, and liquid plastic rather than ink to fabricate ("print") individual, custom-designed pieces of equipment based on computer-generated designs.

For example, in *The Hobbit: An Unexpected Journey*, 3-D printers fabricated animatronic pieces of the goblins that appeared in the movie, such as facial muscles, lips and tongues. These props normally would take weeks to design and fabricate individually by hand, but 3-D printing meant the props were designed and manufactured ("printed") in days. 3-D printing holds real potential for the video production business.

Consumers Intersect with Technology

The future of digital media is bound only by the needs of consumers and the imaginations of media developers, as diverse as the people who are online today and going online tomorrow. The new media universe could become a purer reflection of the real universe than any medium yet created, with unprecedented potential, like all mass media, to both reflect and direct the culture.

"The Internet is still in its infancy, and its potential is enormous," writes media critic David Shaw. The Internet, says Shaw, could "revolutionize human communication even more dramatically than Johann Gutenberg's first printing press did more than 500 years ago."

> **3-D Printing** A process that uses a large commercial printer and liquid plastic to fabricate individual, custom-designed pieces of equipment based on computer-generated designs.

REVIEW, ANALYZE, INVESTIGATE

Chapter 9

Digital Communication Transforms Media

- The emergence of the Internet within the last 40 years has transformed the structure and economics of the U.S. media business.
- The Internet today offers people wireless access to information just about wherever and whenever they want it.
- The Internet delivers all types of media using a single delivery system.
- The Internet is a combination of millions of computer networks sending and receiving data from all over the world.
- In its global size and absence of central control, the Internet is completely different from traditional media.

Digital Media Support Convergence

- Nicholas Negroponte at the Massachusetts Institute of Technology was the first person to identify the theory of convergence.

- The theory of convergence helped shape today's thinking about the Internet.
- Every media industry benefits from convergence.

20th-Century Discoveries Made Internet Possible

- The person most responsible for creating the World Wide Web is Tim Berners-Lee, who created the first browser and gave the World Wide Web its name.
- Marc Andreessen at the University of Illinois created Mosaic, which allowed people to put text and pictures in the same online document.
- Both Andreessen and Berners-Lee placed their creations in the public domain, which meant that anyone with a computer and a modem could download them free.
- A culture of free information access, coupled with a creative, chaotic lack of direction, still permeates the Web today.

Web Opens to Unlimited Access

- Universal access, limited only by the available technology, is what gives the Web the feeling and look of what has been called "anarchy"—a place without rules.
- Today's media companies have a shared interest in seeing their investments in new technologies succeed.

What Happens to Old Media?

- The introduction of a new medium such as the Internet does not mean the end of the old.
- Older media forms continue to evolve and adapt to the new media environment.

Transformation Takes 30 Years

- Paul Saffo says the pace of change has consistently been about 30 years from the introduction of a new technology to its complete adoption by the culture.
- By Saffo's standard—the 30-year rule—American society is beginning to enter the third stage of acceptance, where the majority of the population has adapted to the new technology.

Web Access Leaves Some People Behind

- About 21 percent of Americans still do not go online—because they can't afford it, they're afraid of it or they don't have access.
- The gap between people who have online access and those who do not is called the *digital divide*.

Internet Combines Commerce, Information and Entertainment

- A major source of Web income is the money people pay their Internet service provider.
- Three other potential sources of income on the Web are commerce, advertising and content.
- Most commercial Web sites now carry some form of advertising.
- Tablet devices, such as the iPad, offer another outlet for purchased media.
- Another source of revenue generated by the Internet comes from the development and sale of video games.
- The video game industry is a hybrid that combines equipment (such as Xbox and PlayStation), software and Internet streaming.
- The global video game industry generated $60 billion in 2014.
- Consumers worldwide spend 1 billion hours every day playing video games.
- The average young person has spent 10,000 hours playing video games by the time he or she reaches age 21.
- The average video game player is 30 years old and has been playing games for 12 years.

- Internet tracking tells advertisers about the audience's behavior.

Mobile Media Chase the Audience

- The latest targets for expanding Internet media use are mobile media—smartphones and tablets.
- Mobile media content must be audible and viewable in the small viewing space of a cell phone or tablet screen. News, sports bulletins and audio and video clips are perfectly suited for a mobile media environment.
- All four of the major TV networks and most subscription channels offer their entertainment and news programs online.

Social Networks Grow Globally

- A social network is an Internet community where people can share information, ideas, personal messages, photographs, audio and video.
- Two-thirds of adults who go online use social media sites.
- In 2014, Facebook and LinkedIn were among the most popular social media networks, but Instagram is more popular among young adults ages 18–29.
- Today, 52 percent of online adults use 2 or more social media sites.

Government Attempts to Coordinate and Control the Net

- The federal government has attempted to coordinate and regulate the Internet, but the U.S. government can exercise no control over legal Internet content.
- In 1994, the U.S. Congress named the effort to coordinate the nation's various senders, channels and receivers the National Information Infrastructure (NII).
- In 1997, the U.S. Supreme Court upheld the concept that the U.S. government could not control Internet content.
- In many countries, such as China, the government controls Internet access, which can result in periodic or permanent blocks on Web access and security concerns for Internet providers such as Google.

Protection Sought for Intellectual Property Rights

- Legal protections for digital content are called *intellectual property rights*.
- In 1998, Congress passed the Digital Millennium Copyright Act to make it illegal to share copyrighted material on the Internet.
- The Recording Industry Association of America and the Motion Picture Association of America have aggressively pursued copyright infringement.
- In 2003, Apple introduced iTunes, which allows people to download music legally.

- In 2005, the free music-file-sharing network Grokster shut down after reaching a settlement with the movie and music industries about online piracy.

- In 2010, a federal judge ordered the major remaining music-file-sharing service, LimeWire, to shut down its Web site.

- In February 2013, the Copyright Alert System (CAS) in the United States was activated to warn consumers who are trying to download copyrighted material.

FCC Promotes Internet Neutrality

- On February 26, 2015, the Federal Communications Commission (FCC) outlined Open Internet rules for Internet service providers that require them to keep their networks open and available to carry all legal content from all carriers.

- There are three basic Open Internet FCC rules: (1) no blocking, (2) no throttling, and (3) no paid prioritization.

Storage, Competing Systems and Security Bring Challenges

- Researchers have developed a process called *data compression*, which collapses the size of data files so they are easier to download.

- A recent innovation in data storage is called *cloud computing*, which allows one business to rent remote use of another company's computer space, operating "in the cloud."

- Data streaming is the most familiar use of cloud computing.

- Today's communications system is a mixture of analog and digital technologies.

- At least 10 million homes in the United States still receive only over-the-air broadcasts. They do not subscribe to cable or satellite.

- On January 30, 2013, *The New York Times* announced that Chinese hackers had infiltrated its computer systems and obtained passwords for its reporters and other employees. Officials of the Chinese government denied the charges.

- Less than a week later, Twitter reported that hackers had victimized about 250,000 of its accounts, including accounts for President Barack Obama, Vice President Joe Biden and House Speaker John Boehner.

- On February 12, 2013, President Obama signed an executive order to promote cybersecurity.

- The rules that individual nations develop to govern the Internet will have a profound impact on individuals, businesses, government and the media industries.

Disruptive Technologies Revolutionize Old Concepts

- The Internet means that every element of the mass media industries is in transition.

- Five developments with the potential to affect the future of Internet media are: touch technology, massive open online courses (MOOCs), Open Intellectual Property, camera drones for newsgathering and 3-D printing.

Consumers Intersect with Technology

- The future of digital media is bound only by the needs of consumers and the imagination of media developers.

- The new media universe has unprecedented potential to both reflect and direct the culture.

Key Terms

These terms are defined in the margins throughout this chapter and appear in alphabetical order with definitions in the Glossary, which begins on page 361.

Critical Questions

1. Explain the concept of the digital divide as outlined in this chapter. Why does the digital divide exist? How can the digital divide be eliminated?

2. Why does the Web show remarkable potential for revenue growth? Be specific.

3. What role do video games play in online commerce? What are video game developers doing to counteract their image as providers of violent, shallow content? What do you think of their arguments?

4. Discuss the role of the U.S. government in regulating activity on the Internet. Identify areas in which the government has been successful in regulating the Internet, as well as areas in which it has failed.

5. What communications role do social networks play in today's society? What role do social media play in your life? Explain.

Working the Web

This list includes sites mentioned in this chapter and others to give you greater insight into the Internet media industries.

Apple Inc.
apple.com

The home page of Apple, this site's sections include Apple Store, iPod, iTunes, iPhone, iPad, Mac computers, Apple Watch and software, plus Support. Apple.com Worldwide allows users to shop internationally from the U.S. to Africa, Asia, Europe and Latin America.

CNET
cnet.com

A CBS Interactive site, CNET distributes programming through its Internet television network, CNET Video and its podcast and blog networks. In addition, CNET currently has region-specific and language-specific editions in the UK, Australia, China, France, Germany, Japan and Korea, as well as CNET en Español.

Digital Content Next (formerly the Online Publishers Association)
onlinepub.org

Digital Content Next represents online digital content providers to the advertising community, the press, the government and the public. Members agree to abide by standards of quality and credibility.

Electronic Frontier Foundation (EFF)
eff.org

The Electronic Frontier Foundation is a nonprofit organization that works to protect online user privacy as the requirement for technology becomes a more integral part of everyday life. EFF seeks to accomplish this through litigation, policy analysis, grassroots activism and participation in technology development.

Facebook
facebook.com

With over 1.5 billion users worldwide, Facebook is an online social networking service headquartered in Menlo Park, Calif. Registered users can create a profile, join common groups of interest, add friends, exchange messages, post status updates and photos, share videos and receive notifications when an update and/or a response to something is posted online.

Institute of Electrical and Electronics Engineers (IEEE)
ieee.org

IEEE (pronounced "Eye-triple-E") is "the world's largest professional association dedicated to advancing technological innovation and advancement for the benefit of humanity." The organization's members come from a variety of professions, including computing, sustainable energy systems, aerospace, robotics, communications and health care. Research is presented in clear, accessible language to help readers understand and appreciate the world of computing.

Journal of Electronic Publishing (JEP)
journalofelectronicpublishing.org

JEP is a forum for research and discussion of electronic publishing and the impact of electronic publishing practices. Established in 1995, it recognizes the significant changes in print communication and the growing role of digital communication in transmitting published information. Journal articles present innovative ideas, best practices and progressive thinking about all aspects of publishing, authorship and readership.

MIT Media Lab Project
media.mit.edu

A multidisciplinary research laboratory at the Massachusetts Institute of Technology, the media lab explores how people can use computers to improve their lives. Faculty members, research staff and students at the lab work in research

groups on projects that range from digital approaches for treating neurological disorders to stackable, electric cars for sustainable cities to advanced imaging technologies that can see around a corner.

Pew Internet, Science and Technology Project
pewinternet.org

Solely supported by the privately held Pew Charitable Trust, the Pew Internet, Science and Technology Project explores the effects of the Internet on various aspects of life. Information available on the site includes reports, presentations, data sets and current trends in technology.

Pinterest
pinterest.com

Billed as "a place to discover ideas for all your projects and interests, hand-picked by people like you," Pinterest is a photo-sharing website. New users are required to register before accessing the site. Once online, individuals are free to share just about anything they wish, from thoughts, photos and videos to illustrations, personal concepts and ideas, by "pinning" items to their "board" or user site.

Reddit
reddit.com

Reddit is a content-sharing, open Web site to which users can send photos, ideas for discussion or current news stories via their reddit communities. Reddit claims more than

169 million monthly visitors. Users vote "up" or "down" on topics suggested by contributors. "Hotter" topics get discussed and draw comments; "cooler" topics usually are dropped. Site users call themselves "redditors."

Skype
skype.com

Skype users can do voice calls or video chats from their computers, tablets and mobile devices via the Internet to other devices or telephones or smartphones. Users also can send instant text and video messages, exchange files and images and create conference calls. Most of the service is free, but users are required to use "Skype Credit" or a subscription to call landline or mobile numbers.

The Verge
theverge.com

The Verge delivers information about the latest technology trends and products as well as content and information from a variety of locations around the world, including North and South America, Europe and Asia.

Vine
vine.com

Users can watch, create and share short, looping videos—anytime, anywhere—through videos or "Vines" worldwide via their computer or smartphone.

Impact/Action Videos are concise news features on various topics created exclusively for *Media/Impact*. Find them in *Media/Impact*'s MindTap at cengagebrain.com.

MindTap® Log on to MindTap for *Media/Impact* to access a variety of additional material—including learning objectives, chapter readings with highlighting and note-taking, **Impact/Action Videos**, activities, and comprehension quizzes—that will guide you through this chapter.

ADVERTISING
CATCHING CONSUMERS

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Advertising is an essential yet controversial factor in the growth of American businesses. An advertising billboard stands out high above a worker as he removes snow from Chicago's Wrigley Field on March 2, 2015, in time for opening day.

AP Images/Charles Rex Arbogast

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