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The Internet and New Technologies:

The Media Converge

In the United States, the future of mobile phones as Internet devices will be built on, oddly enough, the demise of old-fashioned television. When television made its transition from analog to digital broadcasting in 2009, the Federal Communications Commission (FCC) assigned the old broadcast spectrum a new purpose: wireless broadband for the Internet. While the FCC planned the auction for the frequencies, observers expected the two largest cell phone companies, AT&T and Verizon, to be the main bidders. But then a company more famous for its search engine became interested: Google.

Why was Google interested? As it turns out, Google didn't want to build a competing cell phone network but wanted to ensure that the next generation of wireless broadband is *open access*; that is, open to all companies who make cell phones, manufacture other communication devices, or provide wireless Internet content. Google, of course, is involved in providing wireless content (like Google search and YouTube), and it would like to put its wireless content—and sell ads, its chief source of revenue—on the new network.

Google didn't win the auction for the wireless spectrum—Verizon and AT&T did—but it did push bids high enough to meet government conditions for making the new network open access. AT&T or Verizon will manage the new network but will be required to allow other companies' devices and cell phone service resellers to operate on it. Up until this point, the U.S. mobile phone market has been a relatively closed system, with customers forced to buy only cell phones approved by their wireless company and to sign contracts for long-term service plans, often with limited Internet content. Closed mobile phone systems are advantageous for companies like Verizon and AT&T but have slowed innovation in the U.S. mobile telephone market. Google envisions an open access system more like those in Europe, East Asia, and Australia. In those regions, customers can keep their cell phones if they switch to new service providers, applications like text messaging are less expensive, and Wi-Fi is widely available for mobile Internet connections.[1]

Open access in the wireless phone industry could force innovation, similar to what happened with wired telephones. At first, U.S. phone customers were required to rent telephones from the limited selection of AT&T (then the monopoly phone company). The most common telephone for years was the heavy, black, rotary dial desk model. In 1968, the FCC opened access to other telephone makers, and new innovations like answering machines, cordless phones, caller ID, fax machines, dial-up modems, and even novelty phones (like a hamburger or football phone) soon hit the market. Today, Google and other companies hope to create a similar wave of innovations, "bringing the Internet developer model to the mobile space," which serves almost three billion people worldwide.[2]

Now, with the spectrum space dedicated to open access, wireless broadband Internet service is poised to become the third major route to high-speed Internet service—in addition to cable and DSL. And Google hopes to be a significant presence on the wireless broadband network, enabling anyone to Google on the run and increasing its advertising revenue.

"A fresh approach to fostering innovation in the mobile industry will help shape a new computing environment that will change the way people access and share information in the future."

ERIC SCHMIDT, GOOGLE CHAIRMAN AND CEO, 2007

◢ **THE INTERNET**—the vast network of telephone and cable lines, wireless connections, and satellite systems designed to link and carry computer information worldwide—was initially described as an *information superhighway*. This description implied that the goal of the Internet was to build a new media network, a new superhighway, to replace the traditional media (e.g., books, newspapers, television, and radio), the old highway system. In many ways, the original description of the Internet has turned out to be true. The Internet has expanded dramatically from its initial establishment in the 1960s to the enormous media powerhouse that encompasses—but has not replaced—all other media today.

Even with its tremendous growth, the full impact of the Internet has yet to emerge. Unlike radio, television, cable, and other mass media, the Internet uniquely lacks technological limitations on how large its databases of content can grow and how many people around the globe can be connected to it. Unending waves of new innovations and capabilities appear rapidly online. These advances have presented both challenges and opportunities to virtually every traditional mass medium, including the recording industry, broadcast and cable television, movies, newspapers, magazines, and books. With its ability to transport both personal conversation and multimedia mass communication, the Internet has begun to break down conventional distinctions among various media industries and between private and public modes of communication.

As governments, corporations, and public and private interests vie to shape the Internet's continuing evolution, answers for many questions remain ambiguous. Who will have access to the Internet, and who will be left behind? Who or what will manage the Internet? What are the implications for the future and for democracy? The task for critical media consumers is to sort through competing predictions about the Internet and new technology, analyzing and determining how the "new and improved" Information Age can best serve the majority of citizens and communities.

This chapter will explore the many dimensions of the Internet, including its evolution, its current structure, its convergence with other forms of media, and its critical issues: ownership, free speech, security, and access. Why discuss the Internet before the many traditional forms of media—books, radio, television, etc.—that both preceded and shaped it? The answer is simple: We are all witnesses and participants in the emergence of this dynamic medium. Because of this unique vantage point, we are able to gain firsthand understanding of the factors that cause a medium to evolve over time, and we can apply that understanding to the older, more established media we'll talk about in later chapters.

◢

The Evolution of the Internet

From its humble origins as an attack-proof military communications network in the 1960s, the Internet became increasingly interactive by the 1990s, allowing immediate two-way communication and one-to-many communication. By the 2000s, the Internet was a multimedia source for both information and entertainment as it quickly became an integral part of our daily lives. For example, in 2000, about 50 percent of American adults were connected to the Internet; by 2008, 75 percent of American adults used the Internet.
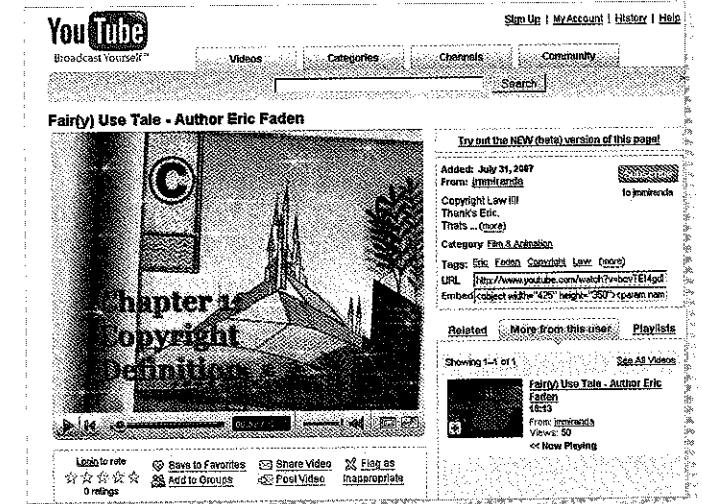
The Birth of the Internet

The Internet originated as a military-government project, with national security as one of its goals. Begun in the late 1960s by the Defense Department's Advanced Research Projects Agency (ARPA), the original Internet—called **ARPAnet** and nicknamed the Net—enabled military and academic researchers to communicate on a distributed network system (see Figure 2.1 on page 47). The distributed network system differed from the centralized telephone system of the time, offering two security advantages. First, because multiple paths linked computers to each other, communications "traffic" would be less likely to get clogged at a single point. Second, because the network was distributed across so many paths, it offered a communication system that was more impervious to technical problems, natural disasters, or military attacks than a centralized system.

In developing one of the prototypes for the military, the Rand Corporation, a national security think tank, conceptualized a communications network that had no central authority and no hierarchical structure. Ironically, one of the most hierarchically structured and centrally organized institutions in our culture—the national defense industry—created the Internet, possibly the least hierarchical and most decentralized social network ever conceived. Each computer hub in the Internet has similar status and power, so nobody can own the system outright and nobody has the power to kick others off the network. There isn't even a master power switch, so authority figures cannot shut off the Internet, although as we will discuss later, some nations and corporations have attempted to restrict access for political or commercial benefit.

To enable military personnel and researchers involved in the development of ARPAnet to better communicate with each other from separate locations, an essential innovation during the development stage of the Internet was **e-mail**. E-mail was invented in 1971 by computer engineer Ray Tomlinson, who developed software to send electronic mail messages to any computer on ARPAnet. He decided to use the @ symbol to signify the location of the computer user, thus establishing the "login name@host computer" convention for e-mail addresses.
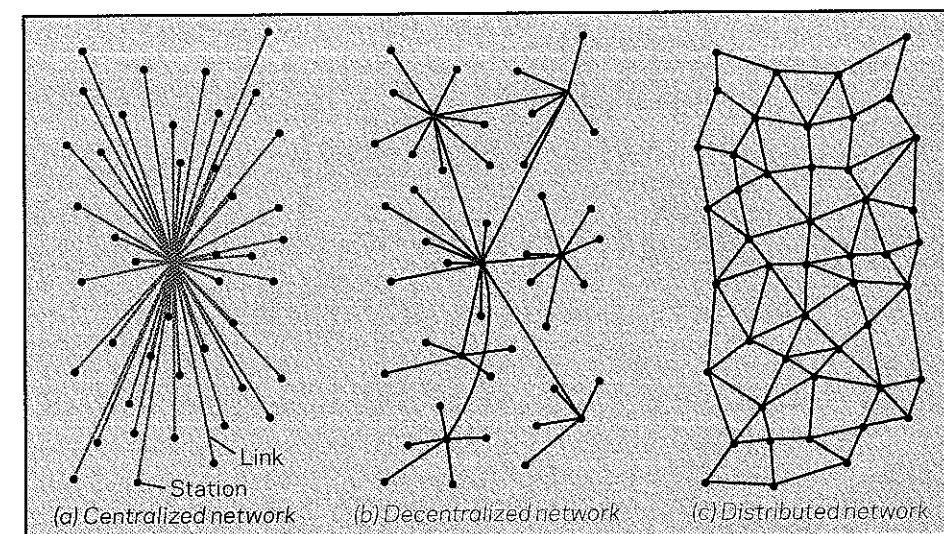
At this point in the development stage, the Internet was primarily used by universities, government research labs, and corporations involved in computer software and other high-tech products to exchange e-mail and to post information on computer *bulletin boards*, sites that listed information about particular topics such as health issues, computer programs, or employment services. As the use of the Internet continued to proliferate, the entrepreneurial stage quickly came about.

The Internet and New Technologies: The Media Converge

Microprocessors
These miniature compu-
ter circuits, developed in
1971, enable personal
computers to be born.
PCs become increasingly
smaller, cheaper, and more
powerful (p. 48).

NSF Network
In 1982, the National
Science Foundation
bankrolls a high-speed
communications
network, connecting
computers across the
country (p. 48).

AOL
The company is
launched in 1985,
becoming the most
successful Internet
service provider for
the next decade
(p. 49).

Web Browsers
The Internet
becomes navigable
with a user-friendly
graphic layout,
and by 1993 the
Internet is poised
to become a mass
medium (p. 50).

Cookies
Information
profiles on users
appear around 2000,
enabling data-mining
practices to flourish
(p. 60).

Broadband
By 2005, dial-up
Internet connec-
tions decline
sharply as users
switch to cable
modem or DSL
connections (p. 49).

Net Neutrality
A nonprofit
coalition
pushes for Net
Neutrality in
2008 (p. 65).

1940	1950	1960	1970	1980	1990	2000	2010

Digital Technology
In the late 1940s, images,
texts, and sounds are first
converted into "binary
code"—ones and zeros—
vastly improving the rate at
which information is stored
and reproduced (p. 51).

ARPAnet
The U.S. Defense
Department begins
research in the late
1960s on a distributed
communication net-
work—the groundwork
for the Internet (p. 46).

E-mail
The process by which
electronic messages are
sent from computer to
computer on a network is
first developed in the early
1970s, revolutionizing
modes of communication
(p. 46).

Fiber-Optic Cable
Thin glass bundles of
fiber are developed
in the mid-1980s,
capable of transmit-
ting thousands of
digital messages and
allowing broadcast
channels, telephone
signals, and other
data to go on the
Internet (p. 48).

Hypertext
In the mid-
1980s, this data-
linking feature
enables users
to link one Web
page to another,
creating the
WWW (p. 49).

Amazon.com
An online shopping
source is launched
in 1995, and
e-commerce takes
hold (p. 60).

Blogging
In 1999, Pyra
Labs releases
Blogger Software,
helping to popu-
larize blogging
(p. 52).

**Instant
Messaging**
The fastest-
growing area of
the Internet by
2001 (p. 52).

About the only thing the Commodore 64 doesn't have is any serious competition.

The Net Widens

From the early 1970s until the late 1980s, a number of factors, both technological and historical, brought the Net from the development stage, in which the Net and e-mail were first invented, to the entrepreneurial stage, in which the Net became a marketable medium.

The first signal of the Net's marketability came in 1971 with the introduction of **microprocessors,** miniature circuits that could process and store electronic signals. This innovation facilitated the integration of thousands of transistors and related circuitry into thin strands of silicon along which binary codes traveled. Using microprocessors, manufacturers were eventually able to introduce the first *personal computers (PCs)*, which were smaller, cheaper, and more powerful than the bulky computer systems that occupied entire floors of buildings during the 1960s. With personal computers now readily available, a second opportunity for marketing the Net came in 1986, when the National Science Foundation developed a high-speed communications network (NSFNET) designed to link university research computer centers around the country and also encourage private investment in the Net. This innovation led to a dramatic increase in Internet use and further opened the door to the widespread commercial possibilities of the Internet.

In the mid-1980s, **fiber-optic cable** became the standard for transmitting communication data speedily. Featuring thin glass bundles of fiber capable of transmitting thousands of messages simultaneously (via laser light), fiber-optic cables began replacing the older, bulkier copper wire used to transmit computer information and made the commercial use of computers even more viable than before. With this increased speed, few limits exist with regard to the amount of information that digital technology can transport.

With the dissolution of the Soviet Union in the late 1980s, the ARPAnet military venture officially ended. By that time, a growing community of researchers, computer programmers, amateur hackers, and commercial interests had already tapped into the Net, creating tens of thousands of points on the network and the initial audience for its emergence as a mass medium.

"A fiber the size of a human hair can deliver every issue ever printed of the *Wall Street Journal* in less than a second."

NICHOLAS NEGROPONTE, *BEING DIGITAL*, 1995

Web 1.0: The World Begins to Browse

The introduction of the World Wide Web and the first web browsers, Mosaic and Netscape, in the 1990s helped to prompt the mass medium stage of the Internet. That first decade of the Web is now often referred to as Web 1.0.

Prior to the 1990s, most of the Internet's traffic was for e-mail, file transfers, and remote access of computer databases. The **World Wide Web** (or the Web) changed all of that. Developed in the late 1980s by software engineer Tim Berners-Lee at the CERN particle physics lab in Switzerland to help scientists better collaborate, the Web was initially a text data-linking system that allowed computer-accessed information to associate with, or link to, other information no matter where it was on the Internet. Known as *hypertext*, this data-linking feature of the Web was a breakthrough for those attempting to use the Internet. **HTML (HyperText Markup Language)**, the written code that creates Web pages and links, is a language that all computers can read, so computers with different operating systems, such as Windows or Macintosh, can communicate easily. The Web and HTML allow information to be organized in an easy-to-use nonlinear way, making way for the next step in using the Internet.

The release of Web **browsers**—the software packages that help users navigate the Web—brought the Web to mass audiences. In 1993, computer programmers led by Marc Andreessen at the National Center for Supercomputing Applications (NCSA) at the University of Illinois in Urbana-Champaign released Mosaic, the first window-based browser to load text and graphics together in a magazine-like layout, with attractive fonts and easy-to-use back, forward, home, and bookmark buttons at the top. In 1994, Andreessen joined investors in California's Silicon Valley to introduce a commercial browser, Netscape. Together, the World Wide Web and Mosaic gave the Internet basic multimedia capability, enabling users to transmit pictures, sound, and video. The Internet experienced extraordinarily rapid growth, and by 1994 the masses had arrived. As *USA Today* wrote that year, this "new way to travel the Internet, the World Wide Web," was "the latest rage among Net aficionados."[3] The Web soon became everyone else's rage, too, as universities and businesses, and later home users, got connected.

The Commercial Structure of the Web

As with other mass media forms, the Internet quickly became commercialized, leading to battles between corporations vying to attract the most users. In the beginning, commercial entities were seeking to capture business in four key areas: Internet service, Web browsing, e-mail, and Web directories/search engines.

Internet Service Providers

One of the first ways businesses got involved with the Internet was by offering connections to it. AOL (formerly America Online), which began in 1985 and bought the world's largest media company, Time Warner, in 2001, was for a long time the United States' top **Internet service provider (ISP)**, connecting millions of home users to its proprietary Web system through dial-up access. As **broadband** connections—which can quickly download multimedia content—became more available (about 60 percent of all American households had such connections by 2008), users moved away from the slower telephone dial-up ISP service (AOL's main service) to high-speed service from cable, telephone, or satellite companies. In 2007, both AT&T and Comcast surpassed AOL in numbers of customers. Other national ISPs include Verizon, Time Warner, and Earthlink. These are accompanied by hundreds of local services, many
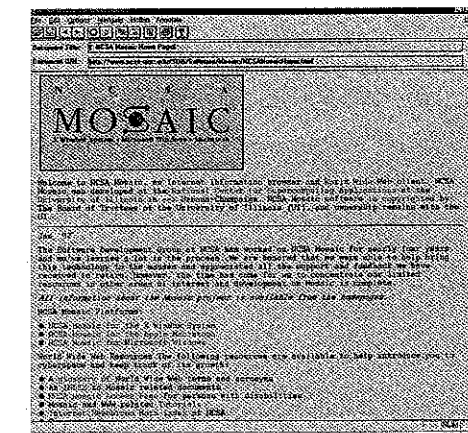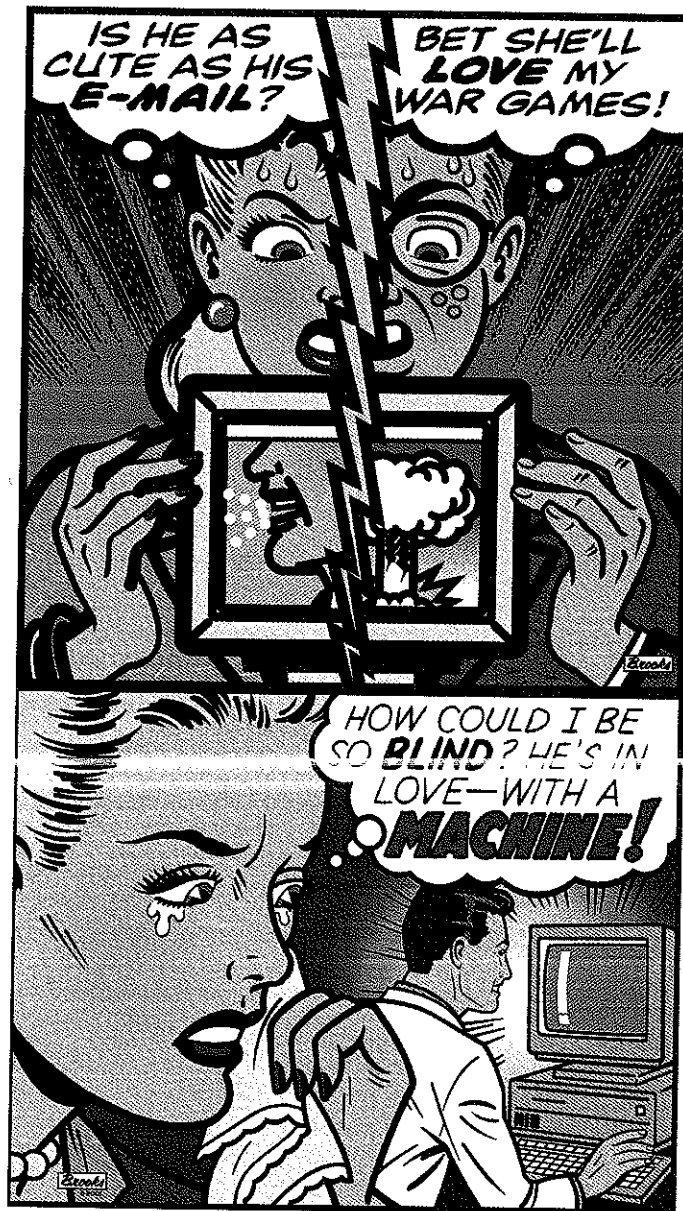
"The medium, or process, of our time—electric technology—is reshaping and restructuring patterns of social interdependence and every aspect of our personal life."

MARSHALL MCLUHAN, 1967

offered by regional telephone companies, that compete to provide consumers with access to the Internet.

Web Browsing

In the early 1990s, as the Web became the most popular part of the Internet, many thought that the key to commercial success on the Net would be through a Web browser, since it is the most common interface with the Internet. As discussed earlier, the first browser to come on to the market was the government-funded Mosaic in 1993. The next year, Andreessen and several of his graduate school colleagues from NCSA relocated to Silicon Valley in California and teamed with venture capital firms to release Netscape.

In 1995, Microsoft released its own Web browser, Internet Explorer, and within a few years, Internet Explorer—strategically bundled with Microsoft operating system software—overtook Netscape as the most popular Web browser, and it continues to dominate the Web browser business today. AOL purchased Netscape in 1998, and today Netscape survives only as a minor brand of AOL. Other browsers, such as Safari, Firefox, Opera, and Konqueror, offer alternatives to Internet Explorer.

E-mail

Another area of the Internet on which companies focused their attention was e-mail. Because sending and receiving e-mail is the most popular use of the Internet, major Web corporations such as Yahoo!, AOL, Google, and Microsoft (Hotmail) offer free Web-based e-mail accounts to draw users to their sites, and each now has millions of users. All of the e-mail services also include advertisements in their users' e-mail messages, one of the costs of the "free" e-mail accounts.

Directories and Search Engines

As the number of Web sites on the Internet quickly expanded, companies seized the opportunity to provide ways to navigate this vast amount of information by providing directories and search engines. **Directories** rely on people to review and catalogue Web sites, creating categories with hierarchical topic structures that can be browsed. Yahoo! was the first company to provide such a service. Yahoo! started as a hobby to keep track of all the information on the Web. In 1994, Stanford University graduate students Jerry Yang and David Filo created a Web page—"Jerry and David's Guide to the World Wide Web"—to organize their favorite Web sites, first into categories, then into more and more subcategories as the Web grew. At that point, the entire World Wide Web was almost manageable, with only about 22,000 Web sites (today there are more than 110 million sites). The guide made a lot of sense to other people, and soon enough Yang and Filo renamed it the more memorable "Yahoo!" and started what would become a very profitable corporation and an important player in the Web's continuing development.

Search engines, meanwhile, offer a different route to finding content by allowing users to enter key words or queries to locate related Web pages. Some of the first search engines were Yahoo!, which searched information in its own directory catalogs, and Alta Vista and Inktomi, which were the first *algorithmic search engines* (searching the entire Web and looking for the number of times a key word shows up on a page). Soon search results were corrupted by Web sites that tried to trick search engines in order to get ranked higher on the results list. One common trick was to embed a popular search term in the page, often typed over and over again in the tiniest font possible and in the same color as the site's background. Although users didn't see the word, the search engines did, and ranked the page higher even if it had little to do with the search term.

Google, released in 1998, became a major success because it introduced a new algorithm that mathematically ranked a page's "popularity" based on how many other pages linked to it. Users immediately recognized Google's algorithm as an improvement, and it became the favorite search engine almost overnight. Even other portals chose to use Google's search engine on their sites. By 2008, Google's market share accounted for about 60 percent of searches in the United States, while Yahoo!'s share was about 23 percent.[4]

> "When search first started, if you searched for something and you found it, it was a miracle. Now, if you don't get exactly what you want in the first three results, something is wrong."
>
> UDI MANBER, GOOGLE ENGINEER, 2007

The Internet Today: Web 2.0

The hallmark of Web 2.0 is *media convergence*, the technological merging of content in different mass media. Recently, the Internet has been the hub for convergence as content from various mass media is distributed and presented on it. The innovation of **digital communication**—central to the development of the first computers in the 1940s—makes media convergence possible because it enables all media content to be created in the same basic way. In digital technology an image, text, or sound is converted into electronic signals represented as a series of binary numbers—ones and zeros—which are then reassembled as a precise reproduction of an image, text, or sound. Digital signals operate as pieces, or bits (from *BInary digiTS*), of information representing two values, such as yes/no, on/off, or 0/1. For example, a typical compact disc track uses a binary code system in which zeros are microscopic pits in the surface of the disc and ones are represented on the unpitted surface. Used in various combinations, these digital codes can duplicate, store, and play back the most complex kinds of media content.

Aided by faster microprocessers, high-speed broadband networks, and a proliferation of digital content, the Internet has become more than just an information source in its second decade as a mass medium. The second generation of the Internet, known as Web 2.0, is a much more rapid and robust environment, and has become a place where music, television shows, radio stations, newspapers, and movies coexist. It has also moved toward being a fully interactive and collaborative medium with instant messaging, social networking, interactive games, and user-created content like wikis, blogs, YouTube, Flickr, and PhotoBucket. It's the users (especially those in their teens and twenties) who ultimately rule in Web 2.0, sharing the words, sounds, images, and creatively edited mash-up videos that make these Web communities worth visiting.

MEDIA CONVERGENCE enables us to access digital content across an array of devices, including mobile phones, digital music players, and notebook computers.

Instant Messaging

One of the Internet's fastest-growing features since the late 1990s is a cousin of e-mail–**instant messaging**, or IM, which enables users to send and receive real-time computer messages. Users assemble personalized "buddy lists" of friends and can chat with any of their buddies who are also online at a given time. Messages tend to be short and conversational, with one small window assigned to each discussion and users often having multiple conversations at once. Although instant messaging can be used to facilitate conversations among coworkers or family members, its most popular use is as an extended social scene among students, who log on after school and chat for hours with their friends. As such, instant messaging foreshadowed the development of social networking sites, another important development in Web 2.0.

Major IM services–many of which now include voice and video chat capabilities–include AOL Instant Messenger (AIM), Microsoft's MSN Messenger Service, Yahoo!'s Messenger, Apple's iChat, Skype (owned by eBay), Gmail's Chat, and MySpaceIM. Instant messaging is one of the Internet's "stickiest" portal services, with users tending to keep open the same advertising-strewn screen for hours. IM windows also operate as full-service portals, providing buttons linking users to their e-mail, news briefs, and Web search engines. In addition, IM users fill out detailed profiles when signing up for the service, providing advertisers with multiple ways to target them as they chat with their friends.

Blogs

The biggest phenomenon in user-created content on the Internet has been Web logs, more commonly known as **blogs**. Blogs are sites that contain articles in chronological, journal-like form, often with reader comments and links to other sites. Ideally, blogs are updated frequently, often with daily posts that keep readers coming back to them. A 2006 study by the Pew Internet & American Life Project found that more than twelve million U.S. adults have created blogs, and 39 percent of Internet users report that they read blogs.[5] Blogs have become personal and corporate multimedia sites, sometimes with photos, graphics, and podcasts that can be played on computers and portable digital devices such as iPods. More recently, *vlogs* have emerged, bringing video to blog pages. Some of the leading blogs include Engadget, Boing Boing, Daily Kos, Talking Points Memo, and the local news/culture "ist" blogs such as *gotham*ist (New York City), *chicago*ist, *la*ist, *dc*ist, *seattle*st, *austin*ist, and *boston*ist.

Wiki Web Sites

Another fairly recent Internet development involves *wiki* (which means "quick" in Hawaiian) technology. **Wiki Web sites** enable anyone to edit and contribute to them. There are several large wikis, such as wikitravel (a global travel guide), WikiMapia (combining Google Maps with wiki comments), and FluWiki (a clearinghouse for influenza pandemic preparation), but the most notable example is Wikipedia: an online encyclopedia that is constantly updated and revised by interested volunteers. All previous page versions of the Wikipedia are stored, allowing users to see how each individual topic develops. The English version of Wikipedia is the largest, containing almost two million articles, but Wikipedias are also being developed in more than one hundred different languages.

Although Wikipedia has become one of the most popular resources on the Web, there have been some criticisms of its open editing model. In 2005, John Seigenthaler Sr., a former editor of the *Nashville Tennessean* newspaper, discovered that the biographical article about him on Wikipedia falsely claimed that he may have played a role in the assassinations of John F.

Kennedy and Robert F. Kennedy. Investigators later identified the man who had posted the false biography content as a joke. While the false copy was corrected, Seigenthaler and many in the mainstream media continue to criticize Wikipedia's open architecture as an invitation to inaccuracies and disinformation.[6] On the other hand, a follow-up study by *Nature* magazine found that Wikipedia's articles were sometimes poorly written but only slightly less accurate than the traditionally edited *Encyclopaedia Britannica*.[7]
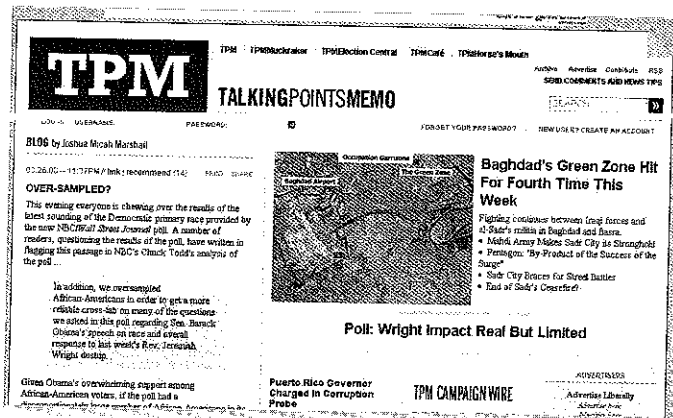
Social Networking Sites

The do-it-yourself content of the Internet doesn't end with blogs and wikis. A whole host of **social networking sites** like MySpace, Facebook, Friendster, LiveJournal, Hi5, Bebo, and Xanga are now available. MySpace and Facebook, in particular, have been two of the fastest-growing sites on the Internet. Both sites allow users to create personal profiles, upload photos, create lists of favorite things, and post messages to connect with old friends and to meet new ones.

MySpace, founded in 2003, is the leading social networking site and is one of the leading Web sites in user traffic. In addition to personal profiles, MySpace is known for its music listings, with millions of unsigned, independent, and mainstream artists alike setting up profiles to promote their music, launch new albums, and allow users to buy songs. Its popularity with teens made it a major site for online advertising. That popularity attracted the attention of media conglomerate News Corp., which bought MySpace in 2005 for $580 million. Shortly after, the company announced the formation of MySpace Records, a label that releases compilation recordings from the site with Interscope Records.

Similar to MySpace, Facebook also creates online social networks. Started at Harvard in 2004 as an online substitute to the printed facebooks the school created for incoming freshmen, Facebook was instantly a hit. Originally, access was restricted to college students, but in 2006 the site expanded to include anyone. Soon after, Facebook grew at a rate of more than two million global users a month, and by 2008 had sixty million users, or about half of MySpace's active users. These numbers also attracted a host of potential buyers; Microsoft beat other rivals to buy a small stake (1.6 percent) in Facebook for $240 million in 2007, setting Facebook's total market value at $15 billion.

Although MySpace and Facebook enable users to limit access to their pages, schools, law-enforcement officials, and parents have voiced concern that online photos and personal information may attract Internet predators. In response to these concerns, both sites have improved their security and launched advertising campaigns to educate users and parents about Internet safety. Public disclosures on social networking sites have also led to real-world consequences. For example, a student at Millersville University was initially denied her teaching degree for "unprofessional" behavior as a result of a photo on her MySpace page.[8]

Massively Multiplayer Online Role-Playing Games (MMORPG)

The newest part of Web 2.0 is the virtual world of online role-playing games. Online role-playing games require users to play through an **avatar**, their online identity. For example, in the fantasy adventure game *World of Warcraft*, the most popular MMORPG with ten million players, users can select from ten different types of avatars, including dwarves, gnomes, night elves, orcs, trolls, and humans. In *Second Life*, a 3D game set in real time, players build human avatars, selecting from an array of physical characteristics and clothing, and then use real money to buy virtual land and trade in virtual goods and services. One of the biggest growth areas is in virtual world games for children. *Club Penguin*, a moderated virtual world purchased by Disney, allows children to play games and chat as colorful penguins. The toy maker Ganz even developed the online *Webkinz* game to revive its stuffed animal sales. Each Webkinz stuffed animal comes with a code for accessing the online game, where players can care for the virtual version of their plush pets.

Online role-playing games have helped to cement the idea of the Internet as a place of convergence—*World of Warcraft*, for example, is now a comic book series, and a movie is in the works. The "massively multiplayer" part of MMORPG also indicates that video games—once designed for solo or small-group play—have expanded to reach large groups at once, similar to traditional mass media.

Web 3.0

There is debate about what the next era of the Web will be like. Certainly it will involve even greater bandwidth for faster, more graphically rich 3D applications. But many Internet visionaries talk about Web 3.0 as the *Semantic Web*, a term that gained prominence after hypertext

inventor Tim Berners-Lee and two coauthors published an influential article in a 2001 issue of *Scientific American*.[9] If "semantics" is the study of meanings, then the Semantic Web is about creating a more meaningful—or more organized—Web. To do that, Web 3.0 promises a layered, connected database of information that software agents will sift through and process automatically for us. Whereas the search engines of Web 2.0 generate relevant Web pages for us to read, the software of Web 3.0 will make our lives even easier as it places the basic information of the Web into meaningful categories—family, friends, calendars, mutual interests, location—and makes significant connections for us.

One Web site that already uses some of the principles of Web 3.0 is Freebase.com, a Semantic Web version of Wikipedia. Whereas Wikipedia presents an article for each topic, plus relevant links, Freebase presents a smaller introduction to the topic that is then accompanied by database fields that point a user in relevant directions and to increasingly relevant connections. A Freebase user might link to an article about a film, then to an article about that film's director, then to a list of all the films the director made, then to links to the director's parents and their associations, and so on. In Web 3.0, a computer will generate these logical connections, not a human.

Ownership Issues on the Internet

One of the unique things about the Internet is that no one owns it. But that hasn't stopped some corporations from trying to control it. Since the **Telecommunications Act of 1996**, which overhauled the nation's communication regulations, most regional and long-distance phone companies and cable operators have competed against each other in the Internet access business. However, there is more to controlling the Internet than being the service provider for it. In addition, companies have realized the potential of dominating the Internet business through search engines, software, and, perhaps most importantly, advertising.

Dividing up the Web

By the end of the 1990s and Web 1.0, four companies—Yahoo!, Microsoft, AOL, and Google—emerged as the leading forces on the Internet, each with a different business angle. Yahoo!'s method has been to make itself an all-purpose entry point—or **portal**—to the Internet. Computer software behemoth Microsoft's approach began by integrating its Windows software with its Internet Explorer Web browser, drawing users to its MSN.com site and other Microsoft applications. AOL attempted to dominate the Internet as the top ISP, connecting millions of home users to its proprietary Web system through dial-up access. Finally, Google made its play to seize the Internet with a more elegant, robust search engine, to help users find Web sites.

In order to stay relevant in the fast-moving era of Web 2.0, these four major Internet companies have transformed themselves by buying promising Internet start-ups and changing their business model in hopes of gaining more leverage over their competitors.

AOL

Though it has faced struggles in recent years, AOL (formerly America Online) continues to be one of the nation's leading Internet companies, a position it gained by controlling the ISP portion of the market in the 1990s. AOL's struggles began in 2000 when, despite being the smaller company, it bought Time Warner, the largest media and entertainment conglomerate in the world, for $164 billion and formed a new company, AOL Time Warner. Unfortunately for AOL, the new corporation never made its expected revenue increases, and profitability dropped

TABLE 2.1

TOP 10 INTERNET PARENT COMPANIES IN THE UNITED STATES, 2008

Note: Parent companies can own a number of unique Web sites. For example, Ask Network is owned by InterActiveCorp, whose operations include Ask.com, Citysearch, LendingTree, Evite, and Match.com.

Source: comScore Media Metrix, June 2008.

Parent	Unique Monthly Visitors (in millions)
1. Google Sites	140,163
2. Yahoo! Sites	140,080
3. Microsoft Sites	119,677
4. AOL LLC	110,841
5. Fox Interactive Media	85,998
6. eBay	72,972
7. Amazon Sites	57,002
8. Wikipedia Sites	53,337
9. Ask Network	51,646
10. Apple, Inc.	45,396

LINUS TORVALDS, the Finnish software developer, holds a license plate bearing the name of his invention, the Linux computer operating system. Since Torvalds's first version of Linux in 1991, hundreds of other developers around the world have contributed improvements to this open-source software rival of Microsoft's Windows.

drastically by 2002. This caused one of the largest financial losses in American history ($99 billion) and prompted "AOL" to be dropped from the corporate name. In 2006, as its dial-up ISP business continued to decline, AOL reinvented itself by dropping its monthly membership service charge and making its content free to everyone on the Internet. The company's strategy was to gain more customers through free services and generate revenue through advertising, and the effort was successful. Today, AOL's sites—such as AOL Instant Messenger, ICQ, Moviefone, and MapQuest—are among the most visited properties on the Internet. Though its power as an ISP has dwindled, AOL still continues to be a major player in Internet content and services.

Microsoft

Microsoft built a near-monopolistic dominance of the Internet through the merger of its Windows operating systems and its Internet Explorer browser software throughout the 1990s. Because of this, the U.S. Department of Justice brought an antitrust lawsuit against Microsoft in 1997, arguing that it used its computer operating system dominance to sabotage competing browsers. However, Microsoft prevailed in 2001, when the Department of Justice dropped its efforts to break Microsoft into two independent companies. European Union regulators were much more aggressive in their antitrust actions against Microsoft, ruling against the company in 2004 and levying a total of about $2.5 billion in fines against Microsoft through 2008 after it found the company proceeded too slowly in sharing interoperability information with other software makers.[10] Today, Microsoft's presence remains considerable: The company continues to operate the most popular Web browser (Internet Explorer) and also owns one of the leading free Web e-mail services (Hotmail), a top Internet service provider (MSN), a popular instant messaging service (MSN Messenger), and a search engine (Live Search).

Yahoo!

Yahoo! quickly grew into a major Internet property after it was established in 1994 by dominating the Web directory portion of the market and, initially, the search engine portion of the market. Although its directory and search engine were eclipsed by Google's, Yahoo! ranks as the second most popular search site. After acquiring the key algorithmic search indexes Overture and Inktomi in 2003, Yahoo! began to compete directly with Google and to aggressively market to users by including sponsored links with search results. Collectively, Yahoo! sites—which include Yahoo! Travel, Flickr, Rivals, Yahoo! Kids, and HotJobs—are the second-most-visited collective of Internet sites (See Table 2.1). Yahoo! also offers popular e-mail, instant messaging, and shopping services.
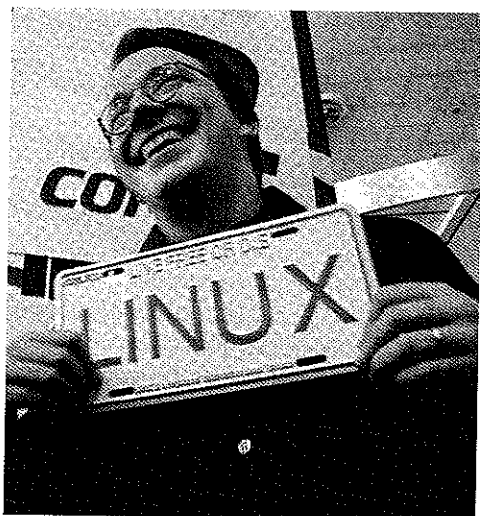
Google

Google, established in 1998, had instant success with its algorithmic search engine, which now controls about 60 percent of the search market and generates billions of dollars of revenue each year through the pay-per-click advertisements that accompany key-word searches. Google also has branched out into a number of other Internet offerings, including shopping (Froogle), mapping (Google Maps), e-mail (Gmail), blogging (Blogger), and even selling advertising time for Clear Channel radio stations (Google Audio Ads). Google has even begun to challenge Microsoft's Office programs with Google Apps, an online bundle of word processing, spreadsheet, calendar, IM, and e-mail software. Google's most significant recent investments have been its acquisition of YouTube for $1.64 billion and its purchase of DoubleClick, one of the Internet's leading advertising placement companies. (See "What Google Owns" in the margin.)

Advertising on the Internet

In the early years of the Web, advertising took the form of traditional display ads placed on pages. The display ads weren't any more effective than newspaper or magazine advertisements (despite the fact that they would sometimes blink), and because they reached small, general audiences, they weren't very profitable. But in the late 1990s, Web advertising began to shift to search engines. Paid links appeared as "sponsored links" at the top, bottom, and side of a search engine result list and even, depending on the search engine, within the "objective" result list itself. Every time a user clicks on a sponsored link, the advertiser pays the search engine for the click-through. For online shopping, having paid placement in searches can be a good thing. But search engines doubling as ad brokers may undermine the utility of search engines as neutral locators of Web sites (see "Media Literacy and the Critical Process: Search Engines and Their Commercial Bias" on page 59).

Advertising has since spread to other parts of the Internet, including social networking sites, e-mail, and IM—all activities in which computer users reveal something about themselves and their interests. This information has made Internet advertising the most targeted kind of advertising in the history of mass communication. For example, Yahoo! gleans information from search terms, Google scans the contents of Gmail messages, and Facebook uses profile information (age, gender, location, interests, etc.) to deliver individualized ads to users' screens.

For advertisers—who for years struggled with how to measure people's attention to ads—the Internet makes advertising easy to track, effective in reaching the desired niche audience, and relatively inexpensive because ads get wasted less often on the disinterested. Yet, the data collection can sometimes go too far. In 2007, tens of thousands of Facebook users protested when the site began tracking what members bought at affiliated sites (like Travelocity.com) and then alerting their friends about those purchases. Facebook relented, and said it wouldn't release online shopping information anymore without a member's approval.

The unrealized potential of targeted advertising has made Web properties like Google, Yahoo!, MySpace, and Facebook extraordinarily wealthy. In fact, Google and Yahoo! have become advertising powerhouses, spreading their efforts into other advertising platforms, with Google selling radio time and Yahoo! forging an alliance to sell advertising for newspaper Web sites.

Alternative Voices

Independent programmers continue to invent new ways to use and communicate over the Internet. While some of their innovations have remained free of corporate control, others have been taken over by commercial interests. Despite commercial buyouts, however, the pioneering spirit of the Internet's independent early days endures; the Internet continues to be a participatory medium where anyone can be involved. Two of the most prominent areas in which alternative voices continue to flourish are in open-source software and digital archiving.

WHAT GOOGLE OWNS

Search
- Google Web Search
- Google Blog Search
- Google News
- Google Book Search
- Google Scholar
- Google Finance
- Google Maps
- Google Images
- Google Video
- Google Earth
- Google Sky
- Ganji (Chinese language search)

Web Sites and Services
- Blogger
- Gmail
- Postini (security and anti-spam service)
- iGoogle
- YouTube
- Knol
- Picasa/Panoramio

Advertising
- Adwords
- Adsense
- Doubleclick
- Feedburner (ads for blogs and RSS feeds)

Software and Apps
- Google Docs
- Google Calendar
- Google Checkout
- Google Desktop
- Google Glossary
- Google Groups
- Google Talk
- Gapminder's Trendalyzer Software (visualization graphics)

Mobile
- Google Mobile
- Google SMS
- Google Maps Mobile
- GrandCentral Communications (Web-based voicemail integration)
- Zipdash (navigation assistance)

Radio
- dMarc Broadcasting (digital audio systems)
- Maestro (digital audio recording)

Open-Source Software

Microsoft has long been the dominant software corporation of the digital age, but independent software creators persist in developing alternatives. One of the best examples of this is the continued development of **open-source software**. In the early days of computer code writing, amateur programmers developed software on the principle that it was a collective effort. Programmers openly shared program source code and their ideas to upgrade and improve programs. Beginning in the 1970s, Microsoft put an end to much of this activity by transforming software development into a business in which programs were developed privately and users were required to pay for both the software and its periodic upgrades.

However, programmers are still developing noncommercial, open-source software, if on a more limited scale. One open-source operating system, Linux, was established in 1991 by Linus Torvalds, a twenty-one-year-old student at the University of Helsinki in Finland. Since the establishment of Linux, professional computer programmers and hobbyists alike around the world have participated in improving it, creating a sophisticated software system that even Microsoft has acknowledged is a credible alternative to expensive commercial programs. Linux can operate across disparate platforms, and companies such as IBM, Dell, and Sun Microsystems, as well as other corporations and governmental organizations, have developed applications and systems that run on it. Still, the greatest impact of Linux is not seen on the PC desktops of everyday computer users but on the operation of behind-the-scenes computer servers.

Digital Archiving

Librarians have worked tirelessly to build nonprofit digital archives that exist outside of any commercial system in order to preserve libraries' tradition of open access to information. One of the biggest and most impressive digital preservation initiatives is the Internet Archive, established in 1996. The Internet Archive aims to ensure that researchers, historians, scholars, and all citizens have universal access to human knowledge; that is, everything that's digital: text, moving images, audio, software, and more than eighty-five billion archived Web pages reaching back to the earliest days of the Internet. The archive is growing at staggering rates as the general public and partners such as the Smithsonian and the Library of Congress upload cultural artifacts. For example, the Internet Archive stores nearly fifty thousand live music concerts, including performances from Jack Johnson, the Grateful Dead, and the Smashing Pumpkins.

The archive has also partnered with the Open Content Alliance to digitize every book in the public domain (generally, those published before 1922). This book-scanning effort is the nonprofit alternative to Google's "Google Print" program, which, beginning in 2004, has scanned books from the New York Public Library as well as the libraries of Harvard, Stanford, and the University of Michigan despite many books' copyright status. Google pays to scan each book (which can cost up to thirty dollars in labor), and then includes book contents in its search results, significantly adding to the usefulness and value of its search engine. Since Google forbids other commercial search engines from accessing the scanned material, the deal has the library community concerned. "Scanning the great libraries is a wonderful idea," says Brewster Kahle, head of the Internet Archive, "but if only one corporation controls access to this digital collection, we'll have handed too much control to a private entity."[11] Under the terms of the Open Content Alliance, all search engines, including Google, will have access to their ever-growing repository of scanned books. Media activist David Bollier has likened open access initiatives like these as part of an information "commons," underscoring the idea that the public collectively owns (or should own) certain public resources, like airwaves, the Internet, and public spaces (such as parks). "Libraries are one of the few, if not the key, public institutions defending popular access and sharing of information as a right of all citizens, not just those who can afford access," Bollier says.[12]

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1 DESCRIPTION. Here's what we find in the first thirty results from Google: numerous sites for obesity research organizations (e. g., American Obesity Association, Obesity Research, and Obesity-online.com), many of which are government funded. Here's what we find in the top-rated results from Yahoo!: numerous sponsored sites (e.g., Jenny Craig, Bariatric Surgery) and the same obesity research organizations.

2 ANALYSIS. A closer look at these results reveals a subtle but interesting pattern: All the sites listed in the top ten results (of both search engine result lists) offer loads of advice to help an individual lose weight (e.g., change eating habits, exercise, undergo surgery, take drugs). These sites all frame obesity as a disease, a genetic disorder, or the result of personal inactivity. In other words, they put the blame squarely on the individual. But where is all the other research that links high obesity rates to social factors (e.g., constant streams of advertising for junk food, government subsidies of the giant corn syrup food sweetener industry, deceptive labeling

Search Engines and Their Commercial Bias

How valuable are search engines for doing research? Are they the best resources for academic information? To test this premise, we're going to do a search for the topic "obesity," which is prevalent in the news and a highly controversial topic.

practices; see Chapter 11)? These society-level views are not apparent in our Web searches.

3 INTERPRETATION. What does it mean that our searches are so biased? Consider this series of connections: Obesity research organizations manufacture drugs and promote surgery treatments to "cure" obese individuals. They are backed by Big Business, which is interested in selling more junk food (not taking social responsibility), and then promoting drugs to treat the problem. A wealthy site can pay for placement, either directly (via Yahoo!) or indirectly (by promoting itself through various marketing channels and ensuring its popularity–Google ranks pages by popularity). As a result, search results today are skewed toward Big Business. Money speaks.

4 EVALUATION. Commercial search engines have evolved to be much like the commercial mass media:

They tend to reflect the corporate perspective that finances them. This does not bode well for the researcher, who is interested in many angles of a single issue. Controversy is at the heart of every important research question.

5 ENGAGEMENT. What to do? Start by including the word *controversy* next to the search term, as in "obesity and controversy." Or, learn about where alternative information sources exist on the Web. A search for "obesity" on the independent media publications AlterNet, MediaChannel, Common Dreams, and Salon, for example, will offer countless other perspectives to the obesity epidemic. Intute (http://www.intute.ac.uk), a powerful subject gateway from Britain; Wikipedia, a collaboratively built encyclopedia; ibiblio; and the National Science Digital Library are other valuable resources that weed out much of the commercial incursions and offer valuable and diverse perspectives.

Security, Appropriateness, and Access

In recent years, three Internet issues have commanded attention: the security of personal and private information, the appropriateness of online materials, and the accessibility of the Internet. Important questions have been raised: Should personal or sensitive government information be private, or should the Internet be an enormous public record? Should the Internet be a completely open forum, or should certain types of communications be limited or prohibited? Should all people have equal access to the Internet, or should it be available only to those who can afford it? With each of these issues there have been heated debates, but no easy resolutions.

Security: The Challenge to Keep Personal Information Private

When you watch television, listen to the radio, read a book, or go to a film, you do not need to provide personal information to others. However, when you use the Internet, whether you are signing up for an e-mail account, shopping online, or even just surfing the Web, you give away personal information, voluntarily or not. As a result, government surveillance, online fraud, and unethical data-gathering methods have become common, making the Internet a potentially treacherous place.

Government Surveillance

Since the inception of the Internet, government agencies around the world have obtained communication logs, Web browser histories, and the online records of individual users who thought their online activities were private. In the United States, for example, the USA PATRIOT Act, which became law about a month after the September 11 attacks in 2001 and was renewed in 2006, grants sweeping powers to law-enforcement agencies to intercept individuals' online communications, including e-mail messages and browsing records. Intended to allow the government to more easily uncover and track potential terrorists and terrorist organizations, many now argue that the Patriot Act is too vaguely worded, allowing the government to probe unconstitutionally the personal records of citizens without probable cause and for reasons other than preventing terrorism. Moreover, searches of the Internet permit law enforcement agencies to gather huge amounts of data, including the communications of people who are not a target of an investigation. For example, a traditional telephone wiretap would intercept only communication on a single telephone line. Internet surveillance involves tracking all of the communications over an ISP, which raises concerns about the privacy of thousands of other users. (To learn more about international government surveillance, see "Global Village: China's Great Firewall" on the next page.)

Online Fraud

In addition to being an avenue for surveillance, the Internet is also increasingly a conduit for online robbery and *identity theft*, the illegal obtaining of personal credit and identity information in order to fraudulently spend other peoples' money. Computer hackers have the ability to infiltrate Internet databases (from banks to hospitals to even the Pentagon) to obtain personal information and to steal credit card numbers from online retailers. Identity theft victimizes hundreds of thousands of people a year, and clearing one's name can take a very long time and cost a lot of money. More than $12 billion worldwide is lost to online fraud artists every year. One particularly costly form of Internet identity theft is known as **phishing.** This scam involves phony e-mail messages that appear to be from official Web sites—such as eBay, PayPal, or AOL—asking customers to update their credit card and other personal information.

Unethical Data Gathering

Another Internet security issue is the unethical gathering of data. Millions of people, despite knowing that transmitting personal information online can make them vulnerable to online fraud, have embraced the ease of **e-commerce:** the buying and selling of products and services on the Internet. What many people don't know is that their personal information may be used without their knowledge for commercial purposes, such as targeted advertising.

One common method commercial interests use to track the browsing habits of computer users is **cookies,** or information profiles that are automatically collected and transferred between computer servers whenever users access Web sites. The legitimate purpose of a cookie is to verify that a user is cleared for access to a particular Web site, such as a library database

GLOBAL VILLAGE

China's Great Firewall

Visionaries of the Internet have long heralded the new online world as one without traditional geographic, political, or legal limits. Media theorist Marshall McLuhan wrote in 1972 that "the wired planet has no boundaries and no monopolies of knowledge."[1] William Gibson, the novelist who coined the word *cyberspace* in the 1980s to represent the virtual reality environment of computing networks, similarly argued that "the Internet is transnational. Cyberspace has no borders."[2] And in 2000, Microsoft leader Bill Gates said, "The Internet is a constantly changing global network that knows no borders."[3]

But as the Internet has matured and global communications have grown more widespread, the real, political borders of nations are making themselves known. This trend became most evident with the operation of the Internet in China. Over 162 million Chinese are online, only a fraction of the country's population of 1.3 billion, but with enough Internet users to be second only to the United States. But in rapidly modernizing China, where for decades the Communist Party has tightly controlled mass communication, the openness of the Internet has led to a clash of cultures. As *Washington Post* reporter Philip Pan writes, "The party appears at once determined not to be left behind by the global information revolution and fearful of being swept away by it."[4]

As more and more Chinese citizens take to the Internet, an estimated thirty thousand government censors monitor their use of Web pages, blogs, chat rooms, and e-mails. This surveillance constitutes what some now call the "Great Firewall of China." Internet police give warning calls to people posting material critical of the government,

force Internet service providers to ax unfavorable blogs, and block thousands of international sites. Many Chinese Internet service providers and Webmasters learn to self-censor to avoid attracting attention. For those who persist in practicing "subversive" free speech, there can be severe penalties: Paris-based Reporters without Borders (www.rsf.org) reports that despite China's promise of improved human rights to win the 2008 Olympics, more than eighty cyber dissidents and journalists are in Chinese prisons for writing articles and blogs that criticized the government. Into this regulated environment enter U.S. Internet corporations eager to establish a foothold in the massive Chinese market. Yahoo! Google, and Microsoft are three of the leading U.S. Internet companies, and they have long promoted the liberating possibilities of the Internet—Google's famous corporate motto even states, "Do no evil."

Yet in much-criticized decisions, all three companies are censoring information to appease Chinese authorities. In 2006, Google created a new search engine for the China market, Google.cn, that filters out offending sites, including many relating to Tibetan independence, the Tiananmen Square massacre, the Falun Gong religion, and even BBC News. Moreover, the Google.cn site stripped away e-mail and blog features because they might be used for political protest. According to the Open Net Initiative, Microsoft did much the same,

prohibiting the creation of blogs with politically unacceptable titles (such as "freedom of speech," "democracy," and "human rights"), and deleting Chinese MSN Space blogs that criticized the government.[5] Yahoo! censored Web sites on its Chinese-language search portal, too, and also made a controversial decision: assisting Chinese Internet police in linking computer addresses to the owners of Yahoo! e-mail accounts. Yahoo!'s complicity led to the jailing of at least three cyber dissidents. One of them, journalist Shi Tao, is now serving a ten-year sentence. In March 2008, the Chinese government shut down YouTube.com for one day because the site contained videos showing recent protests against the government for its treatment of Tibet.

China isn't the only country to impose borders on the Internet. As the Open Net Initiative reports, the governments of Burma, Iran, Saudi Arabia, Sudan, Tunisia, United Arab Emirates, Uzbekistan, Vietnam, and Yemen are among those also conducting extensive Internet filtering. While governments may impose virtual borders on the Internet, attempts of any country to block free speech on the medium may ultimately be futile. As major U.S. Internet firms yield to the government's repressive rules, hundreds of thousands of Chinese citizens are bravely evading them, using free services like Hushmail, Freegate, and Ultrasurf (the latter two produced by Chinese immigrants in the United States) to break through China's "Great Firewall."
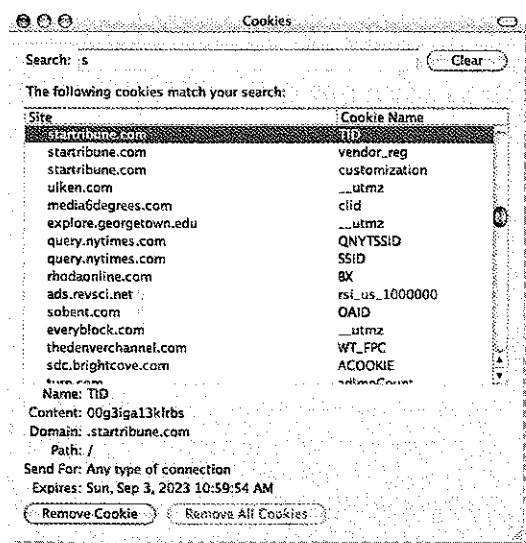
"These two syllables—'opt in'—strike terror in the hearts of Google, Microsoft, AOL, and everyone else in the interactive marketing fields."

JEFF CHESTER, CENTER FOR DIGITAL DEMOCRACY, 2006

that is open only to university faculty and students. However, they can also be used to create marketing profiles of Web users to target them for advertising. Many Web sites require the user to accept cookies in order to gain access to the site.

Even more unethical and intrusive is **spyware**, information-gathering software which is often secretly bundled with free downloaded software. Spyware can be used to send pop-up ads to users' computer screens, to enable unauthorized parties to collect personal or account information of users, or even to plant a malicious click-fraud program on a computer, which generates phony clicks on Web ads that force an advertiser to pay for each click.

In 1998, the U.S. Federal Trade Commission (FTC) developed fair information practice principles for online privacy to address the unauthorized collection of personal data. These principles require Web sites to (1) disclose their data-collection practices, (2) give consumers the option to choose whether or not their data may be collected and provide information on how that data is collected, (3) permit individuals access to their records to ensure data accuracy, and (4) secure personal data from unauthorized use. Unfortunately, the FTC has no power to enforce these principles, and most Web sites either do not self-enforce them or deceptively appear to enforce them when they in fact don't.[13] As a result, consumer and privacy advocates are calling for stronger regulations, such as requiring Web sites to adopt **opt-in** or **opt-out policies.** Opt-in policies, favored by consumer and privacy advocates, require Web sites to obtain explicit permission from consumers before they can collect browsing history data. Opt-out policies, favored by data mining corporations, allow for the automatic collection of browsing history data unless the consumer requests to "opt out" of the practice.

Appropriateness: What Should Be Online?

The question of what constitutes appropriate content has been part of the story of most mass media, from debates over the morality of lurid pulp fiction books in the nineteenth century to arguments over the appropriateness of racist, sexist, and homophobic content in films and music. Although it is not the only material to be subjected to intense scrutiny, most of the debate about appropriate media content, despite the medium, has centered on sexually explicit imagery.

As has always been the case, eliminating some forms of sexual content from books, films, television, and other media remains a top priority for many politicians and public interest groups. So it should not be surprising that public objection to indecent and obscene Internet content has led to various legislative efforts to tame the Web. Although the Communications Decency Act of 1996 and the Child Online Protection Act of 1998 were both judged unconstitutional, the Children's Internet Protection Act of 2000 was passed and upheld in 2003. This act requires schools and libraries that receive federal funding for Internet access to use software that filters out any visual content deemed obscene, pornographic, or harmful to minors, unless disabled at the request of adult users. Regardless of new laws, pornography continues to flourish on commercial sites, individuals' blogs, and social networking pages. As the American Library Association notes, there is "no filtering technology that will block out all illegal content, but allow access to constitutionally protected materials."[14]

Although the "back alleys of sex" of the Internet have caused considerable public concern, Internet sites that carry potentially dangerous information (e.g., bomb building instructions, hate speech) have also incited calls for Internet censorship, particularly after the terrorist

attacks of September 11, 2001, and several tragic school shooting incidents. Nevertheless, many others—fearing that government regulation of speech would inhibit freedom of expression in a democratic society—want the Web to be completely unregulated.

Access: The Fight to Prevent a Digital Divide

A key economic issue related to the Internet is whether the cost of purchasing a personal computer and paying for Internet services will undermine equal access. Coined to echo the term "economic divide" (the disparity of wealth between the rich and poor), the term **digital divide** refers to the growing contrast between the "information haves," those who can afford to purchase computers and pay for Internet services, and the "information have-nots," those who may not be able to afford a computer or pay for Internet services.

Although about 75 percent of U.S. households are connected to the Internet, there are big gaps in access, particularly in terms of age and education. For example, a recent study found that only 37 percent of Americans aged sixty-five and older go online, compared with 72 percent of those aged fifty to sixty-four, 85 percent of those aged thirty to forty-nine, and 92 percent of those aged eighteen to twenty-nine. Education has an even more pronounced effect: only 38 percent of those who did not graduate from high school have Internet access, compared with 67 percent of high school graduates and 93 percent of college graduates.[15]

Another digital divide has developed in the United States as Americans have switched over from slow dial-up connections to high-speed broadband service. By 2007, 71 percent of all Internet users in the United States had broadband connections, but those in lower income households were much less likely to have high-speed service. A Pew Internet & American

A **MUNICIPAL WI-FI** plan for Philadelphia was first announced in 2004 (right). Despite obstacles such as a lawsuit from Verizon and Earthlink pulling out in 2008, the system is now managed by a private investor group. Only time will determine the viability of such networks.

Life Project concluded that American adults split into three groups—"the truly offline (29% of American adults); those with relatively modest connections, intermittent users, and non-users who live with Internet users (24%); and the highly-wired broadband elite (47%)."[16]

One way of avoiding the digital divide is to make Internet access available in public libraries. The Bill and Melinda Gates Foundation has been the leading advocate for providing networked computers in libraries since 1997. Now that 99 percent of public libraries in the United States offer Internet access, the main goal is to increase the number of computers in those libraries. Many government documents, medical information, and other research data now exist solely online, so public libraries serve an important public function for assisting all customers and helping to close the digital divide for those who lack Internet access.

Another way to bridge the digital divide is for cities and other municipalities to offer **Wi-Fi**, or wireless Internet access, which enables users of notebook computers and other devices to connect to the Internet wherever they are. Entire cities, such as Corpus Christi, Texas; St. Cloud, Florida; San Francisco; and Washington, D.C., are developing Wi-Fi mesh systems, enabling citizens with Wi-Fi devices to make free or low-cost broadband Internet connections throughout a municipal area. However, some media corporations see municipal Wi-Fi as a threat because Wi-Fi challenges the almost complete control that the cable industry (via cable modems) and telephone companies (through DSL) have over access to broadband Internet service.

In order to bridge the digital divide between rich and poor in one of the nation's largest cities, Philadelphia embarked on building a 135-square-mile Wi-Fi coverage area to blanket the city in low-cost Internet service. But after building 75 percent of the network, the city's commercial ISP partner, Earthlink, withdrew from the project in 2008, halting its operations until a private group bought the system. The project's fate raises questions about how Wi-Fi service

"[The Internet] is a way for . . . the struggle in our country, and the many other countries where there are a lot of human rights abuses, to be brought out into the open."

JANAL ROBERT ORINA, KENYAN HUMAN RIGHTS WORKER, 1998

CASE STUDY

Net Neutrality

or every mass medium, there comes a pivotal time when society must decide whether it will be a democratic medium or not. Now is that time for the Internet. The issue is called "net neutrality," and it refers to the principle that every Web site—one owned by a multinational corporation or one owned by you—has the right to the same Internet network speed and access. The idea of an open and neutral network has existed since the origins of the Internet, but it has never been written into law.

But now major telephone companies and cable companies, which control 98 percent of broadband access in the United States (through DSL and cable modem service), would like to dismiss net neutrality and give faster connections and greater priority to clients willing to pay higher rates. The companies that want to eliminate net neutrality, including AT&T, Verizon, Comcast, Time Warner, and Qwest, explain that the money they could make with multitier Internet access will give them the incentive they need to build expensive new networks. Ironically, the telephone and cable companies seem to have had plenty of incentive in the past—they've built profitable and neutral networks for more than a decade. Their current drive to dispose of net neutrality appears to be simply a scheme to make more money by making Internet access less equal.

The cable industry is now trying to confuse the issue with deceptive commercials that have all the charm of negative political ads. With images of wide-eyed, bewildered people, they call net neutrality "Mumbo Jumbo" and falsely claim it will make consumers pay more for Internet service.

One of the main groups in favor of preserving net neutrality is SavetheInternet.com, a nonprofit coalition of more than one million people, mostly bloggers, video gamers, educators, religious groups, unions, and small businesses. Even large Internet corporations like Google, Yahoo!, Amazon.com, eBay, Microsoft, and Facebook support net neutrality, because their businesses depend on their millions of customers having equal access to the Web. SavetheInternet.com outlined some of the threats posed by an Internet without network neutrality rules:

- **Small businesses**—The little guy will be left in the "slow lane" with inferior Internet service, unable to compete.

- **Innovators with the next big idea**—Start-ups and entrepreneurs will be muscled out of the marketplace by big corporations that pay Internet providers for the top spots on the Web.

- **iPod listeners**—A company like Comcast could slow access to iTunes, steering you to a higher-priced music service it owns.

- **Political groups**—Political organizing could be slowed by a handful of dominant Internet providers who ask advocacy groups to pay "protection money" for their Web sites and online features to work correctly.

- **Nonprofits**—A charity's Web site could open at snail-like speeds, and online contributions could grind to a halt if nonprofits don't pay Internet providers for access to "the fast lane."

There is some hope for net neutrality. In December 2006, the Federal Communications Commission approved the $85 billion merger between AT&T and BellSouth with the provision (a bitter pill for AT&T) that the deal preserves network neutrality for at least twenty-four months.

In the meantime, the SavetheInternet. com Coalition is petitioning Congress to make a free and open Internet permanent with the Net Neutrality Act. The movement has bipartisan support, but the telecommunications industry has already spent more than $175 million in lobbying, campaign contributions, and phony grassroots organizations to kill net neutrality, so passage is not a certainty.

should be developed: by existing commercial telephone or cable broadband providers, by fully taxpayer-supported municipal systems, by private investment, or through government-commercial ISP partnerships.

Globally, though, the have-nots face an even greater obstacle crossing the digital divide. Although the Web claims to be worldwide, the most economically powerful countries like the United States, Sweden, Japan, South Korea, Australia, and the United Kingdom account for most of its international flavor. In nations such as Jordan, Saudi Arabia, Syria, and Myanmar (Burma), the government permits limited or no access to the Web. In countries like Argentina, Colombia, Brazil, and Mexico, an inadequate telecommunications infrastructure means that consumers must endure painfully long waits to get online. And in underdeveloped countries, phone lines and computers are almost nonexistent. For example, in Sierra Leone, a nation of about six million in West Africa with poor public utilities and intermittent electrical service, only about ten thousand people—about 0.16 percent of the population—are Internet users.[17]

Even as the Internet matures and becomes more accessible, wealthy users are still able to buy higher levels of privacy, specialty access, and capability than other users. Whereas traditional media made the same information available to everyone who owned a radio or a TV set, the Internet creates economic tiers and classes of service. Policy groups, media critics, and concerned citizens continue to debate the implications of the digital divide, valuing the equal opportunity to acquire knowledge.

The Internet and Democracy

Throughout the twentieth century, Americans closely examined emerging mass media for their potential contributions to democracy. As radio became more affordable in the 1920s and 1930s, we hailed the medium for its ability to reach and entertain even the poorest Americans caught in the Great Depression. When television developed in the 1950s and 1960s, it also held promise as a medium that could reach everyone, including those who were illiterate or cut off from printed information. Despite continuing concerns over the digital divide, many have praised the Internet for its democratic possibilities. Some advocates even tout the Internet as the most democratic social network ever conceived.

The biggest threat to the Internet's democratic potential may well be its increasing commercialization. (See "Case Study: Net Neutrality" on page 65.) Similar to what happened with radio and television, the growth of commercial "channels" on the Internet has far outpaced the emergence of viable nonprofit channels, as fewer and fewer corporations have gained more and more control. The passage of the 1996 Telecommunications Act cleared the way for cable TV systems, computer firms, and telephone companies to merge their interests and become even larger commercial powers. Although there was a great deal of buzz about lucrative Internet start-ups in the 1990s, it has been large corporations such as Microsoft, Time Warner, Yahoo!, and Google that have weathered the low points of the dot-com economy and maintained a controlling hand.

About three-quarters of households in the United States are now linked to the Internet, thus greatly increasing its democratic possibilities but also tempting commercial interests to gain even greater control over it and intensifying problems for agencies trying to regulate it. If the histories of other media are any predictor, it seems realistic to expect that the Internet's

potential for widespread use by all could be partially preempted by narrower commercial interests. As media economist Douglas Gomery warns, "Technology alone does not a communication revolution make. Economics trumps technology every time."[18]

However, defenders of the digital age argue that newer media forms—from music distributed as MP3s, to online streaming of films and TV shows, to an array of blogs—allow greater participation than any other medium. **Mass customization**, whereby individual consumers are given the ability by media companies to customize a Web page or other media form, allows the public to engage with and create media as never before. For example, Internet portals such as Yahoo! allow users to personalize their front-page services by choosing their own channels of information—their favorite newspapers or sports teams, local movie listings and weather broadcasts, and many other categories—within the Yahoo! interface. Users of similar services like iGoogle, Facebook, and MySpace get the benefits of creating their own personal Web space—often with their own original content—without having to write the underlying Web code. They are, however, limited to the options, templates, and automated RSS feeds provided by the media company and subject to the company's overall business plan. Such mass customization services blur the boundary between one-to-one communication, which we generally associate with an office conversation or a telephone call, and mass communication, which we associate with daily newspapers or TV programs.

In response to these new media forms, older media are using Internet technology to increase their access to and feedback from varied audiences, soliciting e-mail from users and fostering discussions in sponsored chat rooms and blogs. Skeptics raise doubts about the participatory nature of discussions on the Internet. For instance, they warn that Internet users may be searching out only those people whose beliefs and values are similar to their own. Although it is important to be able to communicate across vast distances with people who have similar viewpoints, these kinds of discussions may not serve to extend the diversity and tolerance that are central to democratic ideals. However, we are still in the early years of the Internet. The democratic possibilities of the Internet's future are still endless.
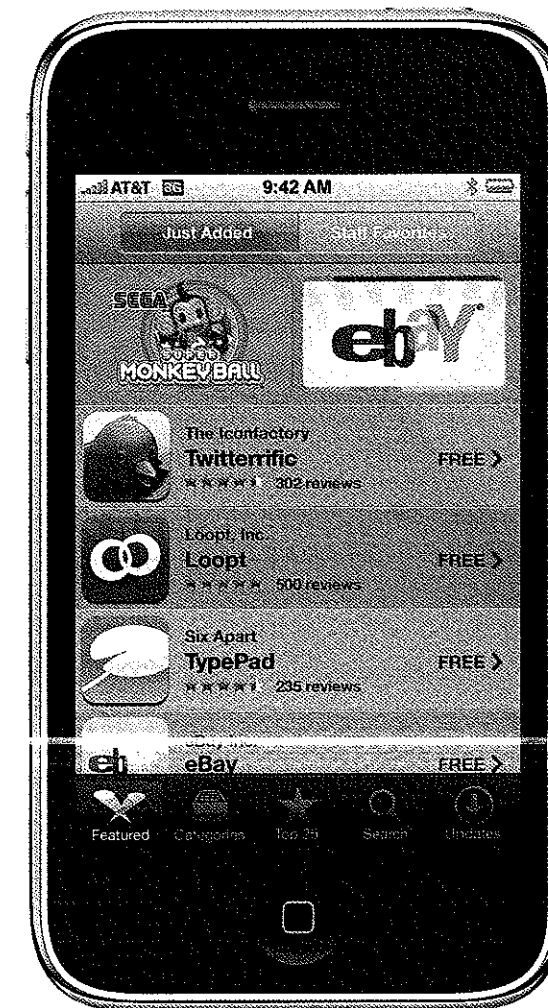
APPLE'S iPHONE, a hub of convergence featuring phone, Internet, music, video, and gaming capabilities, is also a tool for mass customization—as users can choose and purchase from a wide selection of applications ("apps") to make their iPhones fit their needs and wants.