Technology: A Global Economic and Social Force

Technology is an unmistakable economic and social force in our world. Global communications, business exchanges, and the simple tasks that make up our daily lives are all significantly influenced by technology. Whether we are at home, in school, or in the workplace, the emergence of technological innovations has dramatically changed how we live, play, learn, work, and interact with others. Accompanying these dramatic changes in our global community are profound effects on the individual, business, and society, raising important social and ethical questions.

This chapter focuses on these key learning objectives:

- Knowing the dominant features of technology and what fuels technological growth.
- Understanding how e-commerce has changed the way businesses operate and interact with their stakeholders.
- Assessing the emergence of technology superpowers and their effect on the global marketplace.
- Analyzing new Internet opportunities—blogs, vlogs, spam, and phishing—and the challenges they create.
- Recognizing socially beneficial uses of technology in business, education, and medicine.
- Evaluating recent efforts to address and reduce the digital divide.

MySpace.com bolted onto the Internet scene in 2004 as a widely popular site for young people's personal Web pages. These sites included personal photographs and other details about their lives and interests so they could meet and interact with others. By April 2006, 65 million people had accessed MySpace.com.

When the News Corporation acquired MySpace.com in July 2005, the company quickly realized that, in addition to having an exceptionally popular Web site, it had also inherited numerous ethical challenges. Privacy and safety concerns were raised by parents, school officials, and law enforcement officers, since the site sometimes unwittingly made young people vulnerable to pornographers or predators. Richard Blumenthal, Connecticut's attorney general, met with MySpace.com officials and pleaded with them to undertake stringent security measures to protect the site's users.

In April 2006, the News Corporation hired Hemanshu Nigam, former director of consumer security at Microsoft, to oversee safety, education, privacy programs, and law enforcement affairs. The company also announced an advertising campaign to educate parents and young people about Internet safety. The campaign ran public service announcements on MySpace and other

Web sites and television channels owned by the News Corporation.

Blumenthal praised these efforts but continued to challenge the company to do more. "A public safety campaign is a welcome step toward protecting our children from pornography and predators—and people looking for sex—but must be followed by more stringent, specific measures that we have also urged MySpace to take." Among the proposals Blumenthal discussed with MySpace were more stringent age verification measures and free software to let parents block the site from their home computers.[1]

Does business have an ethical responsibility to monitor online activity and provide oversight to protect users, particularly children, from pornographers and predators? Did the News Corporation act quickly enough, or should it have anticipated the problems that arose and have proactively protected its vulnerable users? Could the News Corporation have done more, as suggested by the Connecticut attorney general, regarding users' safety and privacy?

The Explosive Force of Technology

Throughout history, technology has been an explosive force. It has repeatedly erupted, exerting a tremendous influence on humankind, business, and the world. Stemming the advance of technology appears virtually impossible, as seen in the emergence of nanotechnology. The excitement over nanotechnology, the ability to create materials just a few billionths of a meter in size, spread throughout the scientific and business communities like wildfire in the early 2000s. Governments and private venture capitalists invested billions of dollars to support nanotechnology research in the United States, Asia, and Europe. Some believed that nanotechnology might revolutionize the fields of electronics and manufacturing, with analysts predicting a $40 billion to $75 billion market by 2010. By the mid-2000s, nanotech materials had found their way into consumer products such as automobile fuel lines and tires, wrinkle-resistant clothing, sunscreen, and tennis rackets.[2]

But with all this excitement came a cry of fear. Trial lawyers, labor unions, and [illegible]

Greenpeace International, a global environmentalist organization, called for a moratorium on the release of nanoparticles in commercial products until any risks to humans or the environment could be assessed. Douglas Parr, chief scientist for Greenpeace in the United Kingdom, explained, "What we want to avoid is the situation where a small group of financially and technologically interested people develop something and thrust it on the rest of the world." A Greenpeace report warned that particles from nanotechnologically produced materials could be inhaled, potentially causing harm to humans, or could bind with poisonous metals and help disperse them through the environment.[3]

Technology continues to grow because of people themselves. Human beings have sampled and embraced the fruits of knowledge. It seems that people have acquired an insatiable desire for it. They forever seek to expand knowledge of their environment, probably because of the excitement in learning and their belief that more knowledge will help them adapt to their environment. As Bill Joy, Sun Microsystems' chief scientist, explained,

> By 2030, we are likely to be able to build machines, in quantity, a million times as powerful as the personal computer of today. As this enormous computing power is combined with the manipulative advances of the physical sciences and the new, deep understanding in genetics, enormous transformative power is being unleashed. These combinations open up the opportunity to completely redesign the world, for better or worse: The replicating and evolving processes that have been confined to the natural world are about to become realms of human endeavor.[4]

Technology Defined

Technology is a broad term referring to knowledge of and use of humanity's tools and crafts. The dominant feature of technology is change and then more change. For example, nanotechnology has brought so much change that some speak of it in terms of the latest *future shock*, in which change comes so fast and furiously that it approaches the limits of human tolerance and people lose their ability to cope with it successfully. Although technology is not the only cause of change in society, it is a primary cause. It is either directly or indirectly involved in most changes that occur in society.

> Some years ago, right after the start of the personal computer revolution, industry experts observed that if automobiles had developed at the same rate as the computer business, a Rolls-Royce would cost $2.75 and go 3 million miles on a gallon of gas. Today's computers, personal assistants, cellular telephones, music players, and pagers cost less than those of a decade or even a few years ago and offer many times the power and many more times the speed of their predecessors.

[illegible] **telecommunications** [illegible]

An additional feature of technology is that it is self-reinforcing. As stated by Alvin Toffler, "Technology feeds on itself. Technology makes more technology possible."[5] This self-reinforcing feature means that technology acts as a multiplier to encourage its own faster development. It acts with other parts of society so that an invention in one place leads to a sequence of inventions in other places. Thus, invention of the microprocessor led rather quickly to successful generations of the modern computer, which led to new banking methods, electronic mail, bar-code systems, global tracking systems, and so on.

Phases of Technology in Society

Five broad phases of technology have developed, as shown in Figure 13.1. Nations have tended to move sequentially through each phase, beginning with the lowest technology and moving higher with each step, so the five phases roughly represent the progress of civilization throughout history.

The current phase of technology is the **information society**. This phase emphasizes the use and transfer of knowledge and information rather than manual skill. Businesses of all sizes, including the smallest firms, are exploring the benefits of the information age through the availability of nanotechnology and similar inventions. These inventions have catapulted societies into **cyberspace**, where information is stored, ideas are described, and communication takes place in and through an electronic network of linked systems. The technology developed in this new age provided the mechanisms for more information to be produced in a decade than in the previous 1,000 years.

Where will technology head next? Some observers have suggested that society is now at the beginning of a new phase dominated by *biotechnology.* As discussed in more detail in Chapter 14, **biotechnology** is a technological application that uses biological systems or living organisms to make or modify products or processes for specific use. Its applications are common in agriculture, food science, and medicine.[6] This emerging phase of technology extends beyond the thinking and designing of information to the manipulation of organisms to produce fabricated products.

Fueling Technological Growth

The dynamic explosion of technological growth is documented in how businesses operate and people live. Underlying this explosive development are two important factors: economic growth and worker productivity and research and development investment.

The first factor that fuels technological growth is economic growth and worker productivity. During the 1990s, U.S. businesses poured more than $2 trillion into computers, software, and other technology products. This massive spending helped sustain the economic boom that carried the global business community into the 21st century. The adoption of new technologies is also linked to worker productivity. During the late 1990s, productivity grew at almost twice the rate of the previous two decades, since technology was relatively cheap and pervasive. Thus, businesses could afford more technology and workers were more adept in accepting technological improvements. Both conditions led to significant productivity gains during economic expansion.

The second factor fueling technological growth was research and development (R&D). As mentioned above, businesses were more directed in their technology strategies, seeking a quicker and more direct return on their investment.

> Technology superpower Hewlett-Packard replaced 85 global data centers with six cutting-edge facilities at a cost of $1 billion in 2006. But some firms in the banking industry outspent many technology-based companies. J. P. Morgan, a global financial services firm with assets of more than $1.3 trillion, spent three times as much as Hewlett-Packard to overhaul its technology network and to reduce its 90 global data centers to 30 by 2008. Other financial services titans, Morgan Stanley, Merrill Lynch, Citigroup, and Goldman Sachs, reported spending 1 to 2 billion dollars each in 2005 to upgrade their information technology systems.[7]

Government support of technology complements private R&D spending. For example, in the late 1990s the United States launched a program of financial assistance for Internet projects in developing countries. While this effort has

increased more slowly than industry funding, the U.S. government has annually provided more than $60 billion to support technology-based research and development, compared with about $45 billion from European governments. Japanese government officials addressed their relative lack of R&D support by increasing their funding and partnering with Japanese high-tech companies in the quest to surpass the U.S. high-speed Internet infrastructure. Dramatic increases in R&D expenditures for technology development occurred in India, China, Taiwan, and South Korea in the mid-2000s.[8]

The Emergence of High-Technology Business

Technology and business have been intertwined since the Industrial Revolution. The connection between the two became even stronger in the information age, particularly with the advent of electronic business exchanges. Technology influences every aspect of the global marketplace—driving innovation, affecting partnerships, and changing business–stakeholder relationships. Many of these innovations have improved business exchanges, while serious ethical and social challenges also appeared.

Technology and E-Commerce

During the information age phase of technological development, electronic business exchanges between businesses emerged as a powerful global economic and social force. These electronic business exchanges, generally referred to as **e-commerce**, consist of buying and selling goods and services electronically, that is, via the Internet.

By 2000, many businesses had created a multitude of Web pages to advertise and sell their products and services over the Internet. As the number of Internet users increased exponentially, the outreach of this type of marketing exceeded all expectations. By 2005, total business-to-consumer e-commerce sales reached $109.4 billion, a 25 percent increase from 2004 sales, which in turn were more than 25 percent higher than 2003 sales. Online sales for 2006 were expected to rise another 22 percent, to more than $130 billion. The United States was the global leader in e-commerce transactions, accounting for 63 percent of all Internet-based sales in 2005, but the greatest growth was seen in Latin American and Asian countries as technology became more available and faster in these regions.[9] E-commerce has become a way of life, from large companies and smaller start-up businesses to individuals interested in shopping online.

As technology became more affordable and easier to use, small and medium-sized businesses committed investment dollars into e-commerce and technology systems. These businesses discovered that the adoption of technology was a money-saver rather than an expense in the long run and that it gave the businesses a competitive edge over rivals by enabling them to add new services and operate more efficiently.

When a computer programmer offered to create a custom package for Top Dog Daycare, owners Joelle and Tom Hilfers were shocked but agreed to take the plunge, on a payment plan. Three years and nearly $30,000 in

technology investments later, the Hilfers do not know how they ever survived without the company's K-9 Connect software, which allows dog owners to book appointments online, view their accounts, post photos of their pets, and look in on them during the day through a live Web cam. K-9 Connect also stores the pets' vaccination records, meal plans, and special requirements and has pages on e-commerce, dog training, and dog grooming. Business at Top Dog Daycare tripled since adopting the computerized system.[10]

Some of America's biggest companies welcomed the move into e-commerce. They developed new approaches to old problems. Exhibit 13.A profiles some of the largest firms' e-commerce strategies.

E-commerce is undoubtedly here to stay, and new applications appear inevitable. Yet with each new innovation comes the important ethical question: *Should* we develop and offer the new application? At present, many inventors, computer programmers, and business managers appear only to be asking: *Can* we develop and offer the new application? Both questions are paramount as technology and e-commerce continue to influence individual, business, and society interactions in the world in which we live.

Technology "Superpowers"

[illegible] industry is grounded in the work done by companies that dig the trenches and lay the pipes that contain the fiber-optic cable and that build the servers that connect the network. In *BusinessWeek*'s Information Technology 100, the top 20 largest firms included companies that provide networking and telecommunications, as well as businesses that linked companies and consumers through the Internet. "There are the glamour companies, and then there are the companies that are building the new Net economy," reported Edward J. Zander, president of Sun Microsystems, a maker of computer networks. "We're the lumberyard for the Internet."[11]

By 2006, a small but powerful group of technology superpowers controlled many of the entrance ramps to the Internet. The top 10 Web portals for global users and the amount of time they spend on the site are shown in Figure 13.2.

Emerging Global Participation

While much of the discussion thus far in this chapter has focused on technological innovation and technology superpowers in the United States, most industrialized countries are actively pursuing a strategy to include technology in the lives of their citizens. Global participation in technology appears to offer a lucrative market, as illustrated in the following example.

European technology-equipment manufacturers, Nokia, Telefon ABL.M., Ericsson, and Siemens joined with NTT DoCoMo, a Japanese mobile-phone operator, to offer a special promotion to persuade developing countries to adopt the technical standard being used throughout Europe for third-generation (3G) mobile phones. [illegible] content over wireless telephones. In the proposal, the European and Japanese companies agreed to limit the licensing fees they charged on third-generation wireless technology, making the European 3G technology more cost-effective than that of their rivals, primarily the North American-based Qualcomm. The opportunities to promote the European 3G technology were greatly reduced when China decided to adopt its own technical standard for its third-generation mobile phones. Yrio Neuvo, chief technology officer for Nokia, said, "Where countries [illegible] [royalty] levels."[12]

In other regions, technology companies saw incredible opportunities for growth. For example, 60 percent of the 45 million Koreans had mobile phones, but less than half were connected to the Internet. With billions of dollars of direct foreign investment in high-tech companies, Korea was on the verge of entering the global digital community.

Brazil provided an interesting global test case for technological development over the question of free or fee Internet access. Brazil's Universo Online (UOL) and Terra Networks, part of a Spanish telecommunications company, offered free Internet access to all interested Brazilians. This strategy directly conflicted with America Online (AOL) Latin America's approach of offering Internet subscription service for a fee. AOL Latin America reported having 65,000 subscribers before the free Internet option was offered, accounting for less than 3 percent of all Brazilians. Shortly after the competition began, Brazil's UOL added 800,000 of the 1 million new subscribers to Internet service. The long-term viability of offering free Internet service by relying primarily on advertisement revenues remained to be seen.

Developed and developing countries in Asia, South America, and Europe joined North America in efforts to increase access to technology for businesses and individuals. However, as in the debate over nanotechnology described at the beginning of this chapter, some people raised concerns over the ethical challenges arising from an e-commerce world.[13] Many of these ethical concerns are discussed in Chapter 14.

The Internet

More people have more access to technology than ever before. Residents of developing countries increasingly enjoy energy-powered appliances, entertainment devices, and communications equipment. Individuals and businesses in developed countries in North America, Europe, and portions of Asia are depending more than ever on electronic communication devices for access to information and conducting business transactions. In today's workplace environment, nearly every American manager uses a desktop computer, fax machines, answering machines, voice mail, and cellular telephones. These technology devices have become common tools.

The Emergence of the Internet

One of the most visible and widely used technological innovations of recent years has been the Internet, or the World Wide Web. The **Internet** is a global electronic communications network linking individuals and organizations. It enables users to send and receive electronic mail (e-mail) and access information from virtually any library or personal computer. Springing to life in 1994, this conduit of information revolutionized how business was conducted, students learned, and households operated.

An estimate of the number of Internet users is daily or near real time. In March 2005, the Computer Industry Almanac estimated there were 1.08 billion Internet users worldwide (about 1 out of every 6 people) and predicted the number would rise to 1.8 billion by 2010 worldwide. The number of Internet users in the top 15 countries is shown in Figure 1.33.

Contributing to the increasing usage of the Internet are new access opportunities.

TiVo, the maker of a popular digital video recorder, announced a new set of Internet services in June 2004. These services blurred the line between programming delivered over traditional cable and satellite channels and content from the Internet. The new TiVo technology is a standard feature in

its video recorders and allows users to download movies and music from the Internet to a hard drive on the video recorder.[14]

More than a decade after the emergence of a global Internet, new alternatives to it emerged, raising fears that global connectivity might be diminished. German computer engineers in 2006 began building an alternative to the Internet as a political statement. A Dutch company built a new Internet structure as a potentially profitable venture. China created three suffixes in Chinese characters substituting for .com and others, resulting in Web sites and e-mail addresses inaccessible to users outside China. The 22-nation Arab League began a similar system using Arabic suffixes. "The Internet is no longer the kind of thing where only six guys in the world can build it," said Paul Vixie, a key architect of the U.S.-supported Internet. "Now, you can write a couple of checks and get one of your own."[15]

Blogs and Vlogs

By 2006, the blogging revolution was about five years old and many believed it was already out of control. **Blogs**, Web-based journals or logs, are widely popular, according to Technorati, Inc., a company that tracked more than 35 millions blogs in 2006. Technorati reported that the blogosphere was doubling in size every five and one-half months and, on average, a new Web blog was created every second of every day. Nearly 14 million bloggers were still posting 3 months after the blog was created and about 9 percent of new blogs were spam or machine generated.[16]

Most blogs were available with RSS feeds. RSS stands for Really Simple Syndication or Rich Site Summary, depending on the source. RSS allows users to subscribe to specific desired blogs and receive updates from these blogs without having to repeatedly revisit them, via a browser or a separate program called a news reader, which collects the feeds together as an e-mail program collects e-mails.

A new generation of blogs appeared in the mid-2000s, called **vlogs**, or video Web logs. All that was needed was access to a digital camera that could capture moving images and high-speed Internet.

Viewers of Beth Agnew's Web site could watch videos of her laughing while looking at an oak leaf, while wearing a pirate's patch, and while pretending someone has dropped an ice cube down her back. The vlog, laughpracticeblogspot.com, promoted finding hilarity in the mundane and to spread goodwill through laughter. "Anyone anywhere in the world can log into the blog and have a laugh along with me," said Agnew, a college professor in Toronto and self-described certified laugh leader.

The nascent vlog medium attracted thousands of aspiring video producers. The number of vlogs mushroomed due to improved streaming video technology, faster Internet speeds, new Web sites that would host the video free of charge, and new cell phones and other devices designed to play videos. Videos produced by individuals and small companies found their way to on-demand services offered by cable companies and new networks that solicit user content. While most viewers stumbled across vlogs while Web surfing, others found them on Apple Computer Inc.'s iTunes directory, which listed some vlogs, calling them video podcasts. In 2005, Revlon, a cosmetic company, created a vlog displaying a woman trying out the company's new line of makeup at MTV's Music Video Awards, which the company was sponsoring.[17]

While blogs and vlogs entered the vocabulary, governments grew increasingly concerned about the new technology and the legal issues it raised. A Singapore court sentenced two men in 2005 to prison for posting racial slurs on their Internet blog, although the punishments were relatively minor. While many bloggers condemned the racist nature of the remarks, others wondered whether governments such as Singapore, which tolerate little outspoken opposition in the media, were attempting to extend total control over the Internet and blogs.[18]

One of the strongest reactions against blogging was from the Chinese government. By 2005, China had nearly 3 million bloggers, with estimates of close to 7 million by 2007, according to Analysys International, a market research company. The Chinese government banned blogs that called for democracy, criticized top government leadership, advocated Taiwanese independence, or included nudity or explicit sexual comments.[19]

The backlash against blogs came to a head in January 2006 when Microsoft shut down a popular Chinese-language blog that ran edgy content potentially offensive to Chinese authorities. The blog was created by Chinese journalist Zhao Jing under the penname Michael Anti. In the blog, Jing criticized the Chinese government's firing of top editors at a progressive Beijing newspaper. "MSN [Microsoft] is committed to ensuring that products and services comply with global and local laws, norms, and industry practices," explained Brooke Richardson, Microsoft's lead product manager. "Most countries have laws and practices that require companies providing online services to make the Internet safe for local users. Occasionally, as in China, local laws and practices require consideration of unique elements."[20]

Spam

The emergence of the Internet not only launched the blog avalanche but also the onslaught of spam. **Spam** refers to unsolicited e-mails (or junk e-mails) sent in bulk to valid e-mail accounts. These messages can vary from harmless advertisements for commercial products to offensive material and finance scams. Spam creates problems for e-mail users as it makes for extra network traffic and wastes time in sorting through the irrelevant or unwanted e-mails to access the desired messages. The impact of spam on consumers is discussed in Chapter 16.

Spamming has become big business and a big headache for business. According to a *Wall Street Journal* article, spam accounted for 45 percent of all e-mails, or 15 billion messages every day. Spam cost businesses worldwide $20 billion in lost productivity and technology expenses, according to the Radicato Group, a market research company. Radicato predicted that the number of daily spams would rise to more than 50 billion by 2007 and cost almost $200 billion annually.

To combat spam, organizations (and individuals) turned to spam blockers. While generally effective, there were problems making sure the bad e-mails were blocked and the desired e-mails got through.

An employment recruiter, Olga Ocon, decided to sift through an e-mail folder containing messages identified by her company's computer system as spam. Embedded in the 756 e-mail advertisements for Viagra, cell phones, and loan refinancing offers, all ready to be deleted in a few days, were eight resumes from prospective job applicants. Ocon suspected that since some of the resumes contained phrases such as "four-time winner of sales awards" and "oversaw in excess of $40 million in sales," the company's spam filter caught these messages and determined they were e-mails containing money-making offers.[21]

Governments have stepped in to monitor, control, and prosecute spammers who use the Internet for illegal activity.

> JumpStart Technologies, a California Internet marketing company, agreed to pay $900,000 in fines for violating the U.S. CAN-SPAM Act. The Federal Trade Commission charged that JumpStart collected e-mail addresses by offering free movie tickets for consumers who provided the addresses of five friends. JumpStart then spammed those friends using the name of the person who provided the address in the "from" line of the e-mail. The subject line contained a bogus personal message such as "Happy Valentine's Day." JumpStart used these tactics to circumvent antispam filters and to induce recipients to open the messages.[22]

The United Kingdom also has passed antispam legislation making it a crime to send unsolicited e-mail messages to people's private e-mail addresses or cell phones. The government believed that the threat of $8,000 for a lower-court conviction and limitless fines if the case makes its way to a jury would deter the growing spam problem. The U.K. was following Italy's lead, which in 2003 made spam a crime with punishments ranging from $108,000 in fines to three years in prison. "These regulations will help combat the global nuisance of unsolicited e-mails and texts by enshrining in law rights that give consumers more say over who can use their personal details," said U.K. communications minister Stephen Timms.[23]

Phishing

Compounding the problem of spam or junk e-mail is **phishing**, the practice of duping computer users into revealing their passwords or other private data under false pretences. The Anti-Phishing Working Group, a U.S. industry association, reported 1,125 phishing attacks in a single month in 2004. MessageLabs, a U.S. e-mail security company, claimed an 800-fold increase in phishing cases over a six-month period in mid-2004. According to experts, every phishing attack sent out anywhere from 5,000 to 10 million spam e-mails.

Businesses have not sat idly by while con artists have gone phishing.

> In 2003, EarthLink, the largest Internet access provider, went looking for phishers. The company discovered e-mail messages coming from computers in Russia, other eastern European countries, and Asia. "A year ago, there were some phishers out there, and it was mostly teenagers and other people fooling around," said Les Sagraves, EarthLink's chief privacy officer. "Now I think we are moving to more criminal enterprise."[24]

Phishing attacks are growing rapidly, impersonating Internet service providers, online merchants, and banks. Government officials and private investigators said all signs point to gangs of organized criminals most likely in eastern Europe as being behind many of the latest efforts.

Government Regulation of the Internet

Many of the abuses of the Internet described above have fueled a debate over whether government should regulate the content on the Internet. If so, which government or agency should step in?

The Chinese government has aggressively tried to regulate the type of information available to Internet users. In 2005, the Chinese government ordered all China-based Web sites and blogs to register with the government or be closed down. Commercial publishers and advertisers faced fines of up to 1 million yuan,

about $120,000, for failing to register. At the time China had more than 87 million Internet users, the world's second largest online population after the United States. "The Internet has profited many people but it also has brought many problems, such as sex, violence, and feudal superstitions and other harmful information, that has seriously poisoned people's spirits," according to the Ministry of Information Industry Web site.[25]

Technology superpowers from the United States agreed to cooperate with the Chinese government's crackdown on Internet content. Microsoft agreed to ban the words democracy and Dalai Lama from its Chinese blog, and Yahoo! helped the Chinese government locate and arrest a journalist who forwarded an e-mail critical of the government. Critics were quick to condemn these actions. Some argued that this cooperation with government suppression was a violation of human rights, international law, and corporate ethics. Yet, others speculated that if Western firms withdrew from the Chinese Internet market any hope for eventual democratization of China through technology would be lost.

In 2006 Google, Yahoo!, Microsoft and Cisco Systems came under fire at a congressional hearing on human rights for what the subcommittee chairman called a "sickening collaboration" with the Chinese government that was "decapitating the voice of the dissidents" in China. Google admitted that it agreed to remove links on their Web site objectionable to Chinese officials in exchange for access to servers in China. Blogs, in particular, drew the ire of Chinese authorities. Under the agreement, Google blocked most references to Tiananmen Square and Falun Gong and prohibited most mentions of teen pregnancy, homosexuality, and beer. A few months later, Google co-founder Sergey Brin admitted that the company had made a mistake and compromised its moral principles and was planning to reevaluate its position about doing business in China.[26]

Partially in response to the actions taken by the Chinese officials and out of fear of the United States exerting too much control over the Internet, diplomats, social activists, and business leaders approached the United Nations in the mid-2000s as a possible governing body to monitor and regulate the Internet. "The United Nations would be a good platform for that [regulation of the Internet], because it has legitimacy. The countries are all represented," said Izzeldin Mohamed Osman, computer science professor at Sudan University. Some U.S. companies, such as Hewlett-Packard and Sun Microsystems, agreed and joined the discussions at the United Nations, an outgrowth of the United Nations' World Summit on the Information Society in 2003.[27]

Although many computer industry officials at the meeting with the United Nations were skeptical of a U.N. role, they agreed that some sort of international body could be useful in coordinating language issues, security, and getting the Internet into developing countries. But few believed that an international regulatory body had the right to regulate the content of Web sites, as practiced by China and North Korea.

Socially Beneficial Uses of Technology

Despite all the abuses of technology documented above—the misuse of blogs and vlogs, the intrusions of spam and phishing, and censorship of the Internet—technology clearly can be used to improve the quality of our lives. How we communicate with others, conduct business, learn new things, and acquire information is enhanced by technology.

M-Commerce

The ease of access and growing features available through the Internet soon spread into various technologies, such as the cellular telephone. Although cell-phone use has become a common American communication tool, Europeans and Asians embraced the cell phone in a different way—as a method of conducting commerce. **M-commerce**, commerce conducted via mobile or cellular telephones, provides consumers with an electronic wallet when using their cell phones. People trade stocks or make consumer purchases of everything from hot dogs to washing machines and countless other products. France Telecom has marketed a cell phone with a built-in credit card slot for easy wireless payments.

> On a hot and humid Tokyo day in the summer of 2003, a Coca-Cola manager sent an e-mail to several thousand cellular telephone customers. The message urged them to buy a drink from one of the hundreds of high-tech vending machines in their area. The m-commerce machines enabled customers to use their cellular telephones, rather than cash, to purchase products. Those who bought a Coca-Cola product from one of these machines would get a free download of a company ad jingle for their cellular telephones. Sales jumped 50 percent among those who received the message. This was an effort by Coca-Cola to tap into Japanese obsession with cellular telephones and introduce them to the world of m-commerce.[28]

This trend toward m-commerce via cellular telephones was quickly spreading to North America and across Central and South America by the mid-2000s.

Technology and Education

The technological invasion also successfully targeted schools, yet the challenge of providing more and better access and quality learning programs remained. In the United States, a Web-based Education Commission, created by Congress, released a report titled "The Power of the Internet for Learning." The key recommendations from this report included:

- Make powerful new Internet resources, especially broadband access, widely and equitably available and affordable for all learners.
- Build a new research framework of how people learn in the Internet age.
- Revise outdated regulations that impede innovation and replace them with approaches that embrace anytime, anywhere, any-pace learning.
- Protect online learners and ensure their privacy.
- Sustain funding via traditional and new sources that is adequate to the challenge at hand. Technology is expensive, and Web-based learning is no exception.[29]

Technology democratized education by enabling some students in the poorest and most remote communities to access the world's best libraries, instructors, and courses available through the Internet. A digital learning environment provides students with skills to rapidly discover and assess information needed to solve complex problems.

A new technological revolution in education was online education. In the United States, five out of six college students in 2006 were taking classes on a part-time basis, juggling academic commitments with work and family obligations. Online courses and degrees were particularly appealing to these students. The University of Phoenix, the world's largest for-profit education provider, claimed more than 300,000 online students. Apollo Group, based in Phoenix, Arizona, has an enrollment of more than 201,000 students, and Career Education Corporation, the nation's second largest for-profit online education provider, reported a 500 percent

increase in student enrollment in five years.[30] Other businesses were finding new ways for technology to enhance education, as described in the following example.

> In a race to become the iTunes of the publishing world, Amazon.com and Google announced in November 2005 they were developing systems that would allow consumers to purchase online access to any page, section, or chapter of a book. These programs would combine the companies' already available systems of searching books online with a commercial component that could revolutionize the way people access and read books. The idea was to allow readers to buy and download parts of individual books for their own use through their computers rather than go to a store or receive them by mail. This initiative set off a heated discussion among publishers and potential vendors over who will do business with whom and how to split the proceeds. Random House, the largest American publisher, proposed a micropayment model in which readers would be charged about 5 cents a page, with 4 cents going to the publisher to be shared with the author.[31]

Seemingly everywhere we turn, whether in our homes or in school or in the workplace, the technology invasion is all around us, and its influences and opportunities seem inescapable.

Medical Information via the Internet

The explosion of medical information on the Internet has dramatically affected people's lives. How people are examined, diagnosed, and treated; how health-related information is collected and stored; and the time and costs associated with health care have all been changed by technological innovations.

> In 2004, the Food and Drug Administration and several major drug makers announced that they would put tiny radio antennas on the labels of millions of medicine bottles to combat counterfeiting and fraud. Among the medicines targeted were Viagra, one of the most counterfeited drugs in the world, and OxyContin, a pain-control narcotic that has become one of the most abused medicines in the United States. The tagged bottles would only be the large ones used by druggists for prescriptions, but experts do not expect technological innovation to stop there. "It's basically a bar code that barks," explained Robin Koh of Auto-IS Labs of the Massachusetts Institute of Technology. This innovation could make supply chains more efficient and more secure.[32]

In cyberspace the doctor is always in. Individuals can search for an insomnia treatment at 3 a.m. and ask as many questions as they want. They can even search for information anonymously, maintaining privacy, no matter how embarrassing their questions. Although the Internet provides a wealth of medical information, it sometimes fails to protect patients. For example, many Web sites offered consumers the opportunity to obtain medical advice or prescription medications without sufficient physician oversight. In one case, the Illinois Department of Professional Regulation suspended the license of a physician for prescribing Viagra via an Internet pharmacy for a patient he had never seen. The doctor was working as a consultant for The Pill Box, a Texas-based pharmacy chain that sold drugs online. Regulators were concerned that patients might obtain medicines online that were inappropriate or even dangerous.

Beyond government oversight, not-for-profit organizations were formed to aid individuals using the Internet for medical information. For example, the Health on the Net Foundation, a nonprofit organization based in Geneva, Switzerland, offered a seal of approval for medical Internet sites. To earn this approval, a Web site had to follow the organization's guidelines, which included the prominent identification

of the Web sponsor and keeping information up-to-date. In addition, the American Accreditation Health Care Commission, or Utilization Review Accreditation Commission (URAC), as it is also called, sets quality standards for managed care and online health care sites. These Web sites were the first to receive the nonprofit organization's approval based on their disclosure about funding and advertising, quality of editorial content, linking to other sites, and privacy and security.[33]

Special Issue: The Digital Divide

Some people were concerned that the phenomenal development and use of technology were greater in developed than developing countries or among some segments of the population than others in developed countries. This gap between those who have technology and those who do not has been called the **digital divide**. While some debated the severity of the phenomenon, most agreed that it existed.[34]

By 2006, some evidence suggested that the digital divide was becoming smaller. The falling prices of laptops, more computers in public schools and libraries, and the newest generation of cell phones and hand-held devices that connected to the Internet all combined to close the digital divide. Studies and mounting anecdotal evidence suggested that blacks, even those at the lower end of the economic scale, were making significant gains in access to the Internet. As a result, organizations that served African-Americans, as well as companies seeking their business, were increasingly turning to the Internet to reach out to this group.

> According to a Pew national survey completed in 2006, 74 percent of whites go online, 61 percent of African-Americans do, and 80 percent of English-speaking Hispanic-Americans report using the Internet. (The survey did not look at non-English-speaking Hispanics, who some experts believe are not gaining access to the Internet in large numbers.) The 2006 numbers compared favorably to a similar Pew survey taken in 1998. In that study, 42 percent of white Americans said they used the Internet, while only 23 percent of African-Americans did so. Forty percent of English-speaking Hispanic-Americans said they used the Internet.[35]

One reason for the narrowing of the digital divide in the United States may be due to an innovative, yet often criticized, federal government program called E-Rate.

> [illegible][36]

Although saddled with corruption, fraud, and politics since 1996, the E-Rate program contributed to the modernization of technology in many schools and communities and helped narrow the digital divide that previously existed in the United States.

[illegible]

Businesses, government bodies, and nonprofit organizations were challenged by society to address this issue of a digital divide. Some businesses recognized the existence of a digital divide as an opportunity for developing a charitable program.

> Fifteen projects were selected to share a $1 million grant from the DigitAll Hope program sponsored by the Samsung Corporation. The projects ranged

from distance-learning programs for the blind in Vietnam to helping young farmers in Malaysia improve crop yield through information technology. ITExpeditors joined the Digital Partnership program in South Africa with a donation of 440 Pentium II and Pentium III computers and other technology equipment. The computers were installed in 88 school-based eLearning Centers across the country. The donation was paired with other donations of Internet access, free software and technical support for teachers, students, and the local communities.[37]

An initiative specifically targeting underdeveloped populations around the world was announced in 2005.

A nonprofit group called One Laptop Per Child, created by the Massachusetts Institute of Technology (MIT) to distribute laptops worldwide, announced in November 2005 that it had developed a hand-cranked laptop computer that would cost about $100. The group planned to distribute it in underdeveloped countries in an effort to bridge the digital divide between rich and poor nations. "We see education as key to any world problem, from peace to poverty to hunger to the environment," said MIT's Nicholas Negroponte. "Primary education is the most important thing to use because if you mess up primary education, you really then spend a lot of time trying to undo the mess afterwards." The laptop machines were to be available at the end of 2006 and must be distributed through local government ministries and be given away. Under the program's rules, companies or governments will not be permitted to sell them.[38]

Clearly, high-technology businesses, governments, and community groups acting together appear to be winning the battle of making technology more accessible to all people regardless of their race, income, education, age, or residence.

The unmistakable economic and social force of technology is evident in every part of the world, in every industry, and in every aspect of our lives. The technologically driven information age has changed how businesses operate and the quality of our lives, regardless of where we live or what we do. These profound changes give rise to important, and possibly perplexing, questions about whether technology should be controlled or who should manage technology and its growth. These issues are discussed in the following chapter.

[1] "MySpace.com Hires Official to Oversee Users' Safety," *The New York Times Online*, April 12, 2006, *www.nytimes.com*.

[2] "The Business of Nanotech," *BusinessWeek*, February 14, 2005, pp. 64–71.

[3] "Greenpeace Warns of Pollutants from Nanotechnology," *The Wall Street Journal*, July 25, 2003, pp. B1, B4; and "Big Troubles May Lurk in Super-Tiny Tech," *SFGate*, October 31, 2005, *www.sfgate.com*.

[4] Bill Joy, "Why the Future Doesn't Need Us," *Wired*, April 2000, *www.wired.com/wired/archive/8.04/joy*.

FIGURE 13.1 Phases in the Development of Technology

Technology of Technology	Phases in the Development Period	Approximate Activity	Primary Skill Used	Level
1	Nomadic-agrarian	Until 1650	Harvesting	Manual
2	Agrarian	1650–1900	Planting and harvesting	Manual
3	Industrial	1900–1960	Building material goods	Manual and machine
4	Service	1960–1975	Providing services	Manual and intellectual
5	Information	1975–today	Thinking and designing	Intellectual and electronic

[5] Alvin Toffler, *Future Shock* (New York: Bantam, 1971), p. 26.

[6] From "Biotechnology," *Wikipedia*, at *en.wikipedia.org/wiki.biotechnology*.

[7] "The Bank of Technology," *BusinessWeek*, June 19, 2006, p. 54.

[8] "Japan Goes All Out to Catch U.S. in High-Speed Internet Services," *The Wall Street Journal*, November 27, 2000, p. B4; and "Scouring the Planet for Brainiacs," *BusinessWeek,* October 11, 2004, pp. 100–6.

[9] "E-commerce Grew 25% in 2005, Repeating 2004 Sates Growth Performance," *ZDNet,* June 1, 2006, *news.zdnet.com*; and "Online Sales Expected to Rise 20 Percent in 2006," *ZDNet,* May 22, 2006, *news.zdnet.com.*

[10] "High Tech Isn't Just for the Big Guys," *The New York Times Online,* January 20, 2005, *www.nytimes.com*.

Mattel used the Web for designers and licenses in far-flung locales to collaborate on toy design. In two years, Mattel cut the time it takes to develop new products by 20 percent.

Alcoa set up an online showroom to sell off slow-growth businesses. Interested buyers had access to digital balance sheets and profit and loss statements. Alcoa sold three businesses via the Web and saved $200,000 in travel, hotel, and meeting expenses.

Eli Lilly created a Web site where scientific problems were posed and the best minds solved them for cash prizes. In two years, Eli Lilly solved problems in months instead of the expected two to three years.

Lockheed Martin linked 80 major suppliers from around the globe, helping the company build a new stealth fighter airplane. Lockheed Martin saved about $25 million a year over the decade it will take to develop and test the plane.

Saint Alphonsus installed 32 miles of optical fiber for a network to speed transmission of medical images such as heart scans. The images can be viewed almost instantly instead of taking 24 to 48 hours when delivered by hand.

Krispy Kreme established a network linking 320 stores to take orders and alert store managers when they overstocked. Ordering errors were down 90 percent, while productivity gains allowed managers to run twice as many stores.

Source: "Web Smart 50," *BusinessWeek,* November 24, 2003, pp. 82–106.

[11] "Builders of the New Economy," *BusinessWeek*, June 21, 1999, pp. 118–22. For 2006 data see "The Information Technology 100," *BusinessWeek*, July 3, 2006, pp. 78–86.

FIGURE 13.2

The Top 10 Global Web Portals

Sources: "Top Web Sites for March 2006: Yahoo!, Microsoft, MSN; MySpace Is in Top 10," *Nielsen/Net Ratings,* April 2006, *blogs.zdnet.com/Research.*

	Number of Visitors in March 2006 (in thousands)	Time Spent per Person per Visit (hours:minutes:seconds)
Yahoo!	105,027	3:28:39
Microsoft	99,368	0:50:16
MSN	95,124	1:52:10
Google	93,244	1:00:56
AOL	75,348	6:13:54
eBay	55,573	1:59:18
MapQuest	40,809	0:12:05
Amazon	40,721	0:23:21
Real	36,961	0:43:00
MySpace	36,373	2:09:04

[12] "Mobile-Phone Suppliers Court China, Developing Countries," *The Wall Street Journal,* June 9, 2003, p. A6; and "In Tech, China Is Setting the Standard," *The Wall Street Journal,* September 10, 2003, p. A22.

[13] For a good discussion on the ethical challenges in e-commerce see Bette Ann Stead and Jackie Gilbert, "Ethical Issues in Electronic Commerce," *Journal of Business Ethics* 34 (2001), pp. 75–85.

[14] "New Service by TiVo Will Build Bridges from Internet to the TV," *The New York Times Online,* June 9, 2004, *www.nytimes.com.*

FIGURE 13.3

Top 15 Internet Users by Country, 2005

Source: "Population Explosion," ClickZ Network, April 12, 2006, *www.clickz.com.stats.*

(i) Country	Number of Internet Users, in Millions
United States	203.8
China	111.0
Japan	86.3
India	50.6

Germany	48.7
United Kingdom	37.8
South Korea	33.9
Italy	28.9
France	26.2
Brazil	25.9
Russia	23.7
Canada	20.9
Indonesia	18.0
Spain	17.1
Mexico	17.0

[15] "In Threat to Internet's Clout, Some Are Starting Alternatives," *The Wall Street Journal Online,* January 19, 2006, *online.wsj.com.*

[16] See Technorati, Inc.'s, Web site at *www.technorati.com.*

[17] "Vlogger (noun): Blogger with Video Camera," *The Wall Street Journal Online,* December 16, 2005, *online.wsj.com.*

[18] "Singapore Bloggers Given Jail Terms for Posting Racial Comments," Institute for Global Ethics, *Ethics Newsline,* October 11, 2005, *www.globalethics.org*.

[19] "Blogs under Its Thumb," *BusinessWeek,* August 8, 2005, pp. 42–43.

[20] "Microsoft Shuts Down Blog Potentially Offensive to China," *The Wall Street Journal Online,* January 5, 2006, *online.wsj.com.*

[21] "Stringent Spam Filters Mistakenly Block E-Mailed Resumes," *The Wall Street Journal*, April 13, 2004, pp. B1, B4.

[22] "Internet Marketing Company Pays $900,000 Fine for Spam," Institute for Global Ethics, *Ethics Newsline,* March 26, 2006, *www.globalethics.org*.

[23] "Britain Makes It a Crime to Send Spam," Institute for Global Ethics, *Ethics Newsline,* September 22, 2003, *www.globalethics.org*.

[24] [illegible]

[25] "China Orders Web Sites, Blogs to Register with Government," *The Wall Street Journal Online,* June 7, 2005, *online.wsj.com.*

[26] "China's Censorship of Internet, Backed by U.S. Tech Giants, Raises Ethical Concerns," Institute for Global Ethics, *Ethics Newsline,* September 26, 2005, *www.globalethics.org*; "Google Launches Censored Chinese Version of Search Site," Institute for Global Ethics, *Ethics Newsline,* January 30, 2006, *www.globalethics.org*; "Google Co-Founder Concedes Company Compromised Principles in China," Institute for Global Ethics, *Ethics Newsline,* June 12, 2006, *www.globalethics.org*; and "Google's China Problem (and China's Google Problem)," *The New York Times Magazine,* April 23, 2006.

[27] "Countries, Companies Debate U.N. Control over Internet," *Pittsburgh Post-Gazette,* March 28, 2004, p. A10.

[28] "Coke Lures Japanese Customers with Cellphone Come-Ons," *The Wall Street Journal,* September 8, 2003, pp. B1, B4.

[29] "The Power of the Internet for Learning: Moving from Promise to Practice," Report of the Web-Based Education Commission, December 19, 2000, *www.hpcnet.org/commission*.

[30] "The Promise and Challenges of For-Profit Colleges," *Better Investing,* April 2006, pp. 34–37.

[31] "Want 'War and Peace' Online? How about 20 Pages at a Time?" *The New York Times Online,* November 4, 2005, *www.nytimes.com*.

[32] "Tiny Antennas to Keep Tab on U.S. Drugs," *The New York Times Online,* November 15, 2004, *www.nytimes.com*.

[33] For more information see *www.urac.org*.

[34] For a contrarian's viewpoint, see Walter Block, "The 'Digital Divide' Is Not a Problem in Need of Rectifying," *Journal of Business Ethics* 53 (2004), pp. 393–406.

[35] "Digital Divide Closing as Blacks Turn to Internet," *The New York Times Online,* March 31, 2006, *www.nytimes.com*.

[36] For a full historical account of the E-Rate program, see the Federal Communications Commission's Web site at *www.fcc.gov/learnet*.

[37] "Hope Floats: Asian Youths to Bridge Digital Divide," August 22, 2003, and "Global Initiative to Help Close Digital Divide in South Africa," August 27, 2003, both from the *Digital Divide Network* Web site, *www.digitaldividenetwork.org*.

[38] "$100 Laptop—A Tool to Bridge the Gap between Rich and Poor?" Institute for Global Ethics, *Ethics Newsline,* November 21, 2005, *www.globalethics.org*.

- Technological change, which tends to be self-reinforcing, has widespread effects throughout business and society. Some of these effects are beneficial, and some are not. Technological growth is fueled by economic expansion, worker productivity, and research and development investment.
- E-commerce, or online business, has changed how businesses offer, sell, and account for their goods and services in the global marketplace and their interactions with their stakeholders. Individuals are investing and buying goods and services online at an astonishing rate.
- Technology superpowers have built an infrastructure for the information society, enabling people and businesses around the world to communicate and conduct business with each other, spawning the system of e-commerce.
- Technology has exponentially increased our ability to communicate with others around the world through electronic mail, blogs, and vlogs. Accompanying these innovations are significant threats to our privacy and safety.
- Technological innovations in m-commerce, education, and medical information enhance the lives of people throughout the world.
- Differences in age, income, and ethnicity or nationality appear to be associated with a *digital divide.* Recently, collaborative initiatives by businesses, governments, and nonprofit organizations addressing Internet access around the world appear to have somewhat narrowed this digital divide.

Discussion Case: *The Dark Side of the Internet*

Seven years after NASCAR race car driver Neil Bonnett suffered a fatal crash during a practice run at the Daytona International Speedway, his daughter, Kristen, experienced firsthand the dark side of the Internet. Kristen received a telephone call from a reporter asking if she had a comment on the autopsy photos of her father posted on the Internet. "Forty-eight thumbnail pictures, basically of my dad on the table, butt-naked, gutted like a deer, were starring at me directly in the face," said Bonnett.

Some features of the Internet, although usually desirable, can also breed criminal activity. It is an instant, affordable, far-flung outreach system. Criminals can tap into an international audience from anyplace in the world and anonymously hide their activities for months, years, or possibly forever. And they can do it for less than it costs in the physical world. Only $200 buys an e-mail list with the names of thousands of potential victims to launch a spam or phishing scheme. "The [Internet] dramatically lowers transaction costs. Mostly, we think of that as a good thing," said Erik Brynjolfsson, professor of management at MIT's Center for eBusiness. "But it makes it difficult to control many of the activities we want to control."

Illegal Internet commerce has grown at an alarming rate. Black-market activities conducted online were estimated to be more than $60 million annually, about the same amount as U.S. consumers spent on legitimate Internet opportunities. Illegal online gambling reportedly was the sixth-largest business on the Internet.

Internet pornography is a growing business. One adult media publication estimated that online sales of adult videos and similar material exceeded $13 billion in 2005. Complaints about child pornography in cyberspace have grown 600 percent since 1998. In 2006, law enforcement agents raided a $20 billion a year child pornography ring and arrested 27 individuals. These individuals were able to develop a global network to sell child pornographic materials and transmit

streaming video over the Internet. Experts believe that nearly a quarter of all Web sites are involved in child pornography and could grow to a $30 billion industry by 2011.[39]

Of all fraud complaints received by government enforcement agencies, 70 percent relate to the Internet. "North of 70 percent of all e-commerce is based on some socially unacceptable if not outright illegal activity," explained Jeffrey Hunker, dean of the H. J. Heinz III School of Public Policy at Carnegie Mellon University, who helped develop a cybersecurity policy for the United States.

Yet, all of these frightening statistics do not include terrorism. Law enforcement officials know that terrorists use the Internet for communications, research, recruitment, and fund-raising. The people involved in the September 11, 2001, attacks in the United States plotted and coordinated their activities by trading e-mails from locations as innocuous as the public library. Computers analyzed by law enforcement officials indicated that a terrorist group researched the U.S. telephone, electric, and water systems online, learning how digital switches operate those systems.

What may be even more troubling is that legitimate businesses enable Internet outlaws. Mainstream sites, such as Yahoo!, MSN, and Google, initially helped steer customers to gambling sites. They accepted advertisements from online casinos and displayed these ads to viewers visiting their Web sites. Many of these Internet service providers later reversed this practice after mounting public pressure. Banks also assist illegal activities by processing payments of customers who are gambling online illegally. Only under pressure from state attorneys general have some banks started to cut off credit lines to gamblers. eBay agreed to pay $1.5 billion to acquire online-payment processor PayPal and canceled PayPal's gambling business because of the uncertain legal situation surrounding it. PayPal had received two federal grand jury subpoenas concerning its processing of online gambling transactions.

Experts estimate that every 44 seconds an unsavory act is committed on the Internet. Clearly the dark side of the Internet is bigger, broader, scarier, and more damaging than most people realize. But what can be done?

Law enforcement is often plagued by conflicting regulations and statutes and by overlapping jurisdictional battles. For example, Internet financial fraud can be investigated by the Federal Bureau of Investigation, Secret Service, Justice Department, Securities and Exchange Commission, or Federal Trade Commission. If the fraud is international, then the Customs Service can be called in.

In other situations, the illegal Internet activity fails to acquire the necessary attention of law enforcement. Sometimes politicians believe that citizens care more about the drug problem on the street than online. This emphasis focuses resources away from illegal online drug commerce detection that may be the bigger problem. "A doctor prescribing drugs over the Internet can reach many, many more people than a street-level drug dealer," said Robert McCampbell, a U.S. attorney in Oklahoma.

Some states have created effective Internet crime models. For example, in California, progress has been made in stopping identity theft. It was one of the first states to require all credit card receipts to include only the last five numbers on the credit card. Kentucky has one of the most advanced anti–illegal drug distribution systems in the country. The state has an integrated computer system that tracks drug sales from all the pharmacies in the state. It allows doctors or pharmacists to see instantly if the patient has a drug problem and enables regulators to see if doctors or pharmacists are prescribing unusual quantities of drugs.

The final challenge in combating illegal Internet usage is to establish tough laws and penalties for illegal activity online. The Cyber Security Enhancement Act was

passed by Congress in 2002, which promises life sentences for those perpetrating cyberattacks that recklessly endanger human life. But this is only a start.

Sources: "The Underground Web," *BusinessWeek*, September 2, 2002, pp. 67–74; "Man Charged with Using Typos to Lure Children to Online Porn," Institute for Global Ethics, *Ethics News* September 8, 2003, *www.globalethics.org*; and data collected from comScore Networks at *www.comscore.com*.

Key Terms

biotechnology, *279*
blogs, *285*
cyberspace, *279*
digital divide, *292*
e-commerce, *281*
information society, *279*
Internet, *284*
m-commerce, *289*
nanotechnology, *277*
phishing, *287*
spam, *286*
technology, *278*
telecommunications, *279*
vlogs, *285*

Internet Resources

www.ecommercetimes.com	E-Commerce Times
www.e-commerceadvisor.com	E-Commerce Advisor.com
www.isoc.org	Internet Society
www.foresight.org	Foresight Nanotech Institute
www.pewinternet.org	Pew Internet and American Life
www.digitaldividenetwork.org	Digital Divide Network

[39] "Child Porn Crackdown Nabs 27 Suspected Predators," *Information Week*, March 20, 2006, p. 26.

Discussion Questions

1. Which is greater—the benefits from the Internet that enhance our lives, education, and health, or the damage the Internet does to our society through illegal and illicit activities?
2. What can be done to lessen the negative impacts of the underground Internet on society? Who should be responsible for taking these actions?
3. Does this discussion case indicate that technology has gotten out of hand? Are financially or technologically motivated people to blame for these societal crises?