PART 1

Introduction to E-commerce

CHAPTER 1

The Revolution Is Just Beginning

LEARNING OBJECTIVES

After reading this chapter, you will be able to:

- Define e-commerce and describe how it differs from e-business.
- Identify and describe the unique features of e-commerce technology and discuss their business significance.
- Describe the major types of e-commerce.
- Discuss the origins and growth of e-commerce.
- Understand the vision and forces operating during the first five years of e-commerce, and assess its successes, surprises, and failures.
- Identify several factors that will define the next five years of e-commerce.
- Describe the major themes underlying the study of e-commerce.
- Identify the major academic disciplines contributing to e-commerce research.

Amazon at 10:
Profitable At Last

Amazon.com is one of the Web's most exciting and instructive stories. Started in a garage by Jeff Bezos in 1995, it has since grown to become the largest Internet retailer, with the highest levels of customer satisfaction, the fastest revenue growth rates, and finally, after nine years, profitable. One of the Internet "Big Four" companies, along with Yahoo, eBay and Google, few would have thought it possible when Amazon first opened for business that an online bookstore would become one of the premiere general retailers in the world. But Amazon's ability to maintain operations at a sufficiently profitable level is a fact that continues to worry investors in 2005. Critics are of two minds: either Amazon will become the online Wal-Mart (and suffer from its huge size just as Wal-Mart does) or it will fail to deliver superior growth and profits because it has spread itself too thin, taken on too many product lines, and given away too much revenue to customers by offering free shipping and superior service. Supporters, and Bezos himself, counter that Amazon has become the Web's largest retailer on a revenue basis by focusing on the customer, not short-term profits, and that it will ultimately become one of the most profitable by following the same strategy.

@ *Amazon.com's first Web site*

Amazon certainly has had a roller coaster ride in its ten brief years. In December 1999, Jeff Bezos graced the cover of *Time* magazine as its Person of the Year. In the same month, Amazon's stock reached a peak of $113 per share. In January 2001, Amazon reported a whopping $1.411 billion as its overall loss for the year. Its stock hit a low of $6 a share. Amazon laid off 1,300 employees, constituting about 15% of its workforce. Questions about its long-term viability abounded. Bezos promised he would make the company profitable in two years, but few believed this was possible. But, in 2003, Amazon reported soaring sales; it achieved its first annual profit ever (about $35

million), and its stock price more than doubled to $25 a share. The good news continued into 2004 when Amazon reported profits of $588 million on $6.92 billion in revenue.

How was Amazon able to turn around its business from a $1.4 billion annual loss to a $588 million profitable operation despite the dot.com stock market crash and the withdrawal of venture capital funding for e-commerce companies? The story of Amazon.com, the most well-known e-commerce company in the United States, in many ways mirrors the story of e-commerce itself. So, let's take a closer look at Amazon's path to preview many of the issues we'll be discussing throughout this book.

In 1994, Jeff Bezos, then a 29-year-old senior vice president at D.E. Shaw, a Wall Street investment bank, read that Internet usage was growing at 2,300% per year. To Bezos, that number represented an extraordinary opportunity. He quit his job and investigated what products he might be able to sell successfully online. He quickly hit upon books—with over 3 million in print at any one time, no physical bookstore could stock more than a small percentage. A "virtual bookstore" could offer a much greater selection. He also felt consumers would feel less need to actually "touch and feel" a book before buying it. The comparative dynamics of the book publishing, distributing, and retailing industry were also favorable. With over 2,500 publishers in the United States, and the two largest retailers, Barnes and Noble and Borders, accounting for only 12% of total sales, there were no "800-pound gorillas" in the market. The existence of two large distributors, Ingram Books and Baker and Taylor, meant that Amazon would have to stock only minimal inventory.

Bezos easily raised several million dollars from private investors and in July 1995, Amazon.com opened for business on the Web. Amazon offered consumers four compelling reasons to shop there: (1) selection (a database of 1.1 million titles), (2) convenience (shop anytime, anywhere, with ordering simplified by Amazon's patented "1-Click" express shopping technology), (3) price (high discounts on bestsellers), and (4) service (e-mail and telephone customer support, automated order confirmation, tracking and shipping information, and more).

In January 1996, Amazon moved from a small 400-square-foot office into a 17,000-square-foot warehouse. By the end of 1996, Amazon had almost 200,000 customers. Its revenues had climbed to $15.6 million, but the company posted an overall loss of $6.24 million. In May 1997, Amazon went public, raising $50 million. Its initial public offering documents identified several ways in which Amazon expected to have a lower cost structure than traditional bookstores: it would not need to invest in expensive retail real estate, it would have reduced personnel requirements, and it would not have to carry extensive inventory, since it was relying in large part on book distributors. During 1997, Amazon continued to grow. It served its one-millionth unique customer, expanded its Seattle warehouse, and built a second 200,000-square-foot distribution center in Delaware. By the end of 1997, revenues had expanded to $148 million for the year, but at the same time, losses also grew, to $31 million.

In 1998, Amazon expanded its product line, first adding music CDs and then videos and DVDs. Amazon was no longer satisfied with merely selling books. Its business strategy was now "to become the best place to buy, find, and discover any product or

services available online." It also opened Web sites in Great Britain and Germany. Amazon, pundits noted, was planning to be the online Wal-Mart. Revenues for the year increased significantly, to $610 million, but the losses also continued to mount, quadrupling to $125 million.

The year 1999 was a watershed year for Amazon. Bezos's announced goal was for Amazon to become the "Earth's Biggest Store." In February, Amazon borrowed over $1 billion, using the funds to finance expansion and cover operating losses. During the year, it added electronics, toys, home improvement products, software, and video games to its product lines. It also introduced several marketplaces, including Amazon.com Auctions (similar to that offered by eBay), zShops (online storefronts for small retailers), and sothebys.amazon.com, a joint venture with the auction house Sotheby's. To service these new product lines, Amazon significantly expanded its warehouse and distribution capabilities, adding eight new distribution centers comprising approximately 4 million square feet. By the end of 1999, Amazon had more than doubled its 1998 revenues, recording sales of $1.6 billion. But at the same time, Amazon's losses showed no signs of abating, reaching $720 million for the year.

Although Bezos and Amazon were still riding high at the end of December 1999, in hindsight, it's possible to say that the handwriting was on the wall. Wall Street analysts, previously willing to overlook continuing and mounting losses as long as the company was expanding into new markets and attracting customers, began to wonder if Amazon would ever show a profit. They pointed out that as Amazon built more and more warehouses brimming with goods, and hired more and more employees (it had 9,000 by the end of 2000), it strayed farther and farther from its original vision of being a "virtual" retailer with lean inventories, low headcount, and significant cost savings over traditional bookstores.

The year 2000 ended on a much different note than 1999 for Amazon. No longer the darling of Wall Street, its stock price had fallen significantly from its December 1999 high. In January 2001, it struggled to put a positive spin on its financial results for 2000, noting that while it had recorded a staggering $1.4 billion loss on revenues of $2.7 billion, its fourth-quarter loss was slightly less than analysts' projections. For the first time, it also announced a target for profitability, promising a "pro forma operating profit" by the fourth quarter of 2001. Few analysts were impressed, pointing out that the method by which Amazon was suggesting its profit be calculated was not in accordance with generally accepted accounting principles. They also noted that growth had slowed in Amazon's core books, music, and video business, and profit margins were slim in the faster-growing categories, such as consumer electronics.

In 2001 and 2002, Bezos and fellow executives began to implement their strategy for profitability: cut prices, offer free shipping, and leverage Amazon's investment in infrastructure and consumer brands, while lowering costs of operation significantly. By evolving and leveraging the existing business model, Amazon hoped to do what analysts thought was impossible.

The "easy" part of the strategy was driving business revenues higher by offering customers the "lowest possible prices" for a broad range of goods, providing free shipping for orders greater than $25, and then multiplying sources of revenue. Amazon's

Merchants@ and Amazon Marketplace allow other businesses to fully integrate their Web sites into Amazon's site to sell their branded goods, but use Amazon's fulfillment and payment infrastructure. Nordstrom, Toys "R" Us, Gap Inc., Target, and many other retailers use Amazon to sell their goods and then pay Amazon commissions and fees. Amazon also offers its expertise in Web site hosting through its Merchant.com program to national brands such as Target. In the Amazon Marketplace program, individuals are encouraged to sell their used or new goods on Amazon's Web site even when they compete directly with Amazon's sales of the same goods. Amazon reports that sales by third parties now represent 27% of revenues and that it makes as much profit on commissions from other vendors as it does from its own sales.

Lowering costs proved difficult, but not impossible. In early 2001, Amazon closed two of its eight warehouses and laid off 15% of its workforce. It hired 35-year-old engineer Jeffrey Wilke and a half-dozen mathematicians to figure out how to cut costs. The team found a way to redistribute book inventory among the warehouses to reduce shipping costs; used Six Sigma quality measures to reduce errors in fulfillment; consolidated orders from around the country prior to shipping (adding an extra day to fulfillment of "free shipping" orders); and further lowered shipping costs by using its own trucks to deliver orders to postal system centers. Wilke and his team reduced fulfillment costs from 15% of revenue in 2000 down to 10% by 2003. The effort contributed to Amazon's first ever annual profit in 2003: $35.3 million on revenues of $5.26 billion. The results were even better in 2004: a $588.5 million profit on revenues of $6.92 billion.

Looking back on the last ten years, it's clear that Wall Street and Main Street have differing views on Amazon. Amazon has been a tremendous Main Street e-commerce success story even if it took nine years to achieve profitable operations. It has changed its business model several times, focused on improving the efficiency of its operations, and maintained a steady commitment to keeping its 49 million customers satisfied. In 2005, Amazon was one of the leaders in a survey of customer satisfaction with retail Web sites, while traditional bricks-and-mortar retailers such as Target and Costco received low marks for their online offerings. Right now, Amazon must be counted as an online retailing success story. Few would have predicted this outcome in 1995, or even in 2000.

For the future, however, Amazon faces powerful competitors who keep innovating, such as eBay and Yahoo! Shopping. eBay has been profitable from its first day, while Yahoo achieved profitability in 2002. But despite Wall Street critics, Bezos has not changed his original vision: in 2005, for instance, he announced additional expenditures to increase customer convenience, such as a flat-fee shipping membership program (Amazon Prime). And although Amazon's revenues continue to grow, profits in 2005 were down compared to 2004. So the Amazon roller coaster ride continues, and what's around the next curve remains to be seen.

SOURCES: "Amazon Announces Free Cash Flow Surpassed $500 Million for the First Time; Customers Joined Amazon Prime at an Accelerated Rate," Amazon.com, February 2, 2006; Amazon.com Form 10-Q for the nine months ended September 30, 2005, filed with the Securities and Exchange Commission on October 27, 2005; "Amazon Faces the Challenges of Its Second Decade," by Paul Festa, Cnetnews.com, July 15, 2005; "A Retail Revolution Turns 10," by Gary Rivlin, *New York Times*, July 10, 2005; "Tabs on Tech: The Internet," by Laurie Kawakami, *Wall Street Journal*, June 1, 2005; "Internet Big Four: Worth a Look As Growth Stocks," by James B. Stewart, *Wall Street Journal*, May 4, 2005; "Amazon Net Falls As Rivals Take Toll, by Mylene Mangalindan, *Wall Street Journal*, April 27, 2005; Amazon.com, Inc. Form 10-K for the fiscal year ended December 31, 2004, filed with the Securities and Exchange Commission on March 11, 2005; "Amazon Gets the Last Laugh," by Chip Bayers, *Business 2.0*, September 2002.

The Amazon story is emblematic of the e-commerce environment of the past ten years: an early period of business vision, inspiration, and experimentation, followed by the realization that establishing a successful business model based on those visions would not be easy, which then ushered in a period of retrenchment and reevaluation, ultimately leading to a more finely tuned business model that actually produces profits. During the last two years, the fortunes of the e-commerce revolution once again have been contrary to what many people thought would happen after the stock market crash of March 2001, when the stock market value of e-commerce, telecommunications, and other technology stocks plummeted by more than 90%. After the bubble burst, many people were quick to write off e-commerce and predicted that e-commerce growth would stagnate, and the Internet audience itself would plateau. But they were wrong.

1.1 E-COMMERCE: THE REVOLUTION IS JUST BEGINNING

The e-commerce revolution is just beginning. For instance:

- Online consumer sales expanded by more than 23% in 2005 to an estimated $142–$172 billion (eMarketer, Inc., 2005a; Shop.org and Forrester Research, 2005).
- The number of individuals online in the United States increased to 175 million in 2005, up from 170 million in 2004 (The total population of the United States is about 300 million.) (eMarketer, Inc., 2005b; U.S. Census Bureau, 2005).
- Of the total 112 million households in the United States, the number online increased to 71 million or 63% of all households (U.S. Census Bureau, 2005; eMarketer, Inc., 2005b; Pew Research Center, 2005).
- On an average day, 70 million people go online. Around 140 million send e-mail, 8 million have created a blog, 4 million share music on peer-to-peer networks, and 3 million use the Internet to rate a person, product, or service (Pew Research Center, 2005; Pew Internet & American Life Project, 2004).
- The number of people who have purchased something online expanded to about 110 million, with additional millions shopping (gathering information) but not purchasing (Pew Research Center, 2005).
- The demographic profile of new online shoppers broadened to become more like ordinary American shoppers (Pew Research Center, 2005; Fallows, 2004).
- B2B e-commerce—use of the Internet for business-to-business commerce—expanded about 30% in 2005 to more than $1.5 trillion (U.S. Department of Commerce, 2005).
- The Internet technology base gained greater depth and power, as more than 42 million households had broadband cable or DSL access to the Internet in 2005—about 38% of all households (eMarketer, Inc., 2005c).

- Initial public offerings (IPOs) returned, with 233 IPOs in 2004—more than the number of IPOs in 2002 and 2003 combined. The Internet stock group rebounded in value, along with the entire NASDAQ stock exchange, which is primarily composed of technology stocks. The rebound in Internet stocks was led by Google's IPO, which raised $1.67 billion. Google's stock opened at $85 on the first day and has since rocketed to the $300 range (Hoovers, 2005; Rivlin, 2005; Elgin, 2005).

These developments signal many of the themes in the new edition of this book (see **Table 1.1**). More and more people and businesses will be using the Internet to conduct commerce; the e-commerce channel will deepen as more products and services come online; more industries will be transformed by e-commerce, including travel reservations, music and entertainment, news, software, education, and finance; Internet technology will continue to drive these changes as broadband telecommunications comes to more households; pure e-commerce business models will be refined further to achieve higher levels of profitability; and traditional retail brands such as Sears, J.C.Penney, and Wal-Mart will further extend their multichannel, bricks-and-clicks strategies and retain their dominant retail positions. At the societal level, other trends are apparent. The major digital copyright owners have increased their pursuit of online file-swapping services; states have successfully moved toward taxation of Internet sales; and sovereign nations have expanded their surveillance of, and control over, Internet communications and content.

In 1994, e-commerce as we now know it did not exist. In 2005, just ten years later, around 110 million American consumers are expected to spend about $142–$172 billion purchasing products and services on the Internet's World Wide Web (eMarketer, Inc., 2005b; Shop.org and Forrester Research, 2005; Rainie, 2005). Although the terms Internet and World Wide Web are often used interchangeably, they are actually two very different things. The *Internet* is a worldwide network of computer networks, and the *World Wide Web* is one of the Internet's most popular services, providing access to over 8 billion Web pages. We describe both more fully later in this section and in Chapter 3. In 2005, businesses are expected to spend over $1.5 trillion purchasing goods and services from other businesses on the Web (U.S. Department of Commerce, 2005). From a standing start in 1995, this type of commerce, called *electronic commerce* or *e-commerce*, has experienced growth rates of well over 100% a year; although the rate has slowed and is now growing at about 25% a year. These developments have created the first widespread digital electronic marketplaces. Even more impressive than its spectacular initial growth is its future predicted growth. By 2008, analysts estimate that consumers will be spending around $232 billion and businesses about $3 trillion in online transactions (eMarketer, Inc., 2005a; 2003; U.S. Department of Commerce, 2005).

TABLE 1.1 MAJOR TRENDS IN E-COMMERCE, 2006

BUSINESS

- Retail consumer e-commerce continues to grow at double-digit rates.
- The online demographics of shoppers continues to broaden.
- Online sites continue to strengthen profitability by refining their business models and leveraging the capabilities of the Internet.
- The first wave of e-commerce transformed the business world of books, music, and air travel. In the second wave, eight new industries are facing a similar transformation: telephones, movies, television, jewelry, real estate, hotels, bill payments, and software.
- The breadth of e-commerce offerings grows, especially in travel, information clearinghouses, entertainment, retail apparel, appliances, and home furnishings.
- Small businesses and entrepreneurs continue to flood into the e-commerce marketplace, often riding on the infrastructures created by industry giants such as Amazon, eBay, and Overture.
- Brand extension through the Internet grows as large firms such as Sears, J.C.Penney, L.L. Bean, and Wal-Mart pursue integrated, multi-channel bricks-and-clicks strategies.
- B2B supply chain transactions and collaborative commerce continue to strengthen and grow beyond the $1.5 trillion mark.

TECHNOLOGY

- Wireless Internet connections (Wi-Fi, Wi-Max, and 3G telephone) grow rapidly.
- Podcasting takes off as a new media format for distribution of radio and user-generated commentary.
- The Internet broadband foundation becomes stronger in households and businesses. Bandwidth prices fall as telecommunications companies re-capitalize their debts.
- RSS (Really Simple Syndication) grows to become a major new form of user-controlled information distribution that rivals e-mail in some applications.
- Computing and networking component prices continue to fall dramatically.
- New Internet-based models of computing such as .NET and Web services expand B2B opportunities.

SOCIETY

- Self-publishing (user-generated content) and syndication in the form of blogs, wikis and social networks grow to form an entirely new self-publishing forum.
- Newspapers and other traditional media adopt online, interactive models.
- Conflicts over copyright management and control grow in significance.
- Over half the Internet user population (about 80 million adults) join a social group on the Internet.
- Taxation of Internet sales becomes more widespread and accepted by large online merchants.
- Controversy over content regulation and controls increases.
- Surveillance of Internet communications grows in significance.
- Concerns over commercial and governmental privacy invasion grow.
- Internet fraud and abuse occurrences increase.
- First Amendment rights of free speech and association on the Internet are challenged.
- Spam grows despite new laws and promised technology fixes.
- Invasion of personal privacy on the Web expands as marketers find new ways to track users.

THE FIRST THIRTY SECONDS

It is important to realize that the rapid growth and change that has occurred in the first ten years of e-commerce represents just the beginning—what could be called the first thirty seconds of the e-commerce revolution. The same technologies that drove the first decade of e-commerce (described in Chapter 3) continue to evolve at exponential rates. Changes in underlying information technologies and continuing entrepreneurial innovation promise as much change in the next decade as seen in the last decade. The twenty-first century will be the age of a digitally enabled social and commercial life, the outlines of which we can barely perceive at this time. It appears likely that e-commerce will eventually impact nearly all commerce, or that most commerce will be e-commerce by the year 2050.

Business fortunes are made—and lost—in periods of extraordinary change such as this. The next five years hold out extraordinary opportunities—as well as risks—for new and traditional businesses to exploit digital technology for market advantage. For society as a whole, the next few decades offer the possibility of extraordinary gains in social wealth as the digital revolution works its way through larger and larger segments of the world's economy, offering the possibility of high rates of productivity and income growth in an inflation-free environment.

This book will help you perceive and understand the opportunities and risks that lie ahead. By the time you finish, you will be able to identify the technological, business, and social forces that have shaped the first era of e-commerce and extend that understanding into the years ahead.

WHAT IS E-COMMERCE?

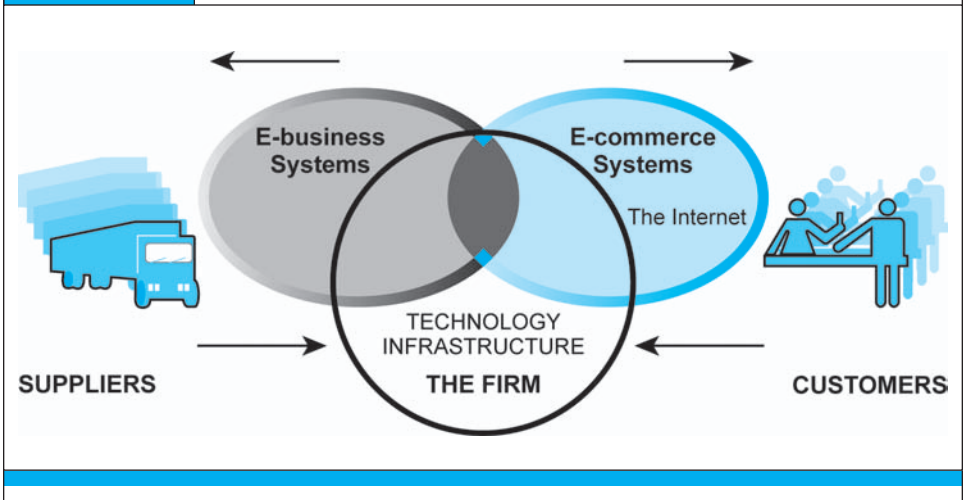
e-commerce
the use of the Internet and the Web to transact business. More formally, digitally enabled commercial transactions between and among organizations and individuals

Our focus in this book is **e-commerce**—the use of the Internet and the Web to transact business. More formally, we focus on digitally enabled commercial transactions between and among organizations and individuals. Each of these components of our working definition of e-commerce is important. *Digitally enabled transactions* include all transactions mediated by digital technology. For the most part, this means transactions that occur over the Internet and the Web. *Commercial transactions* involve the exchange of value (e.g., money) across organizational or individual boundaries in return for products and services. Exchange of value is important for understanding the limits of e-commerce. Without an exchange of value, no commerce occurs.

THE DIFFERENCE BETWEEN E-COMMERCE AND E-BUSINESS

There is a debate among consultants and academics about the meaning and limitations of both e-commerce and e-business. Some argue that e-commerce encompasses the entire world of electronically based organizational activities that support a firm's market exchanges—including a firm's entire information system's infrastructure (Rayport and Jaworksi, 2003). Others argue, on the other hand, that e-business encompasses the entire world of internal and external electronically based activities, including e-commerce (Kalakota and Robinson, 2003).

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



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

We think that it is important to make a working distinction between e-commerce and e-business because we believe they refer to different phenomena. For purposes of this text, we will use the term **e-business** to refer primarily to the digital enablement of transactions and processes *within* a firm, involving information systems under the control of the firm. For the most part, in our view, e-business does not include commercial transactions involving an exchange of value across organizational boundaries. For example, a company's online inventory control mechanisms are a component of e-business, but such internal processes do not directly generate revenue for the firm from outside businesses or consumers, as e-commerce, by definition, does. It is true, however, that a firm's e-business infrastructure provides support for online e-commerce exchanges; the same infrastructure and skill sets are involved in both e-business and e-commerce. E-commerce and e-business systems blur together at the business firm boundary, at the point where internal business systems link up with suppliers or customers, for instance. E-business applications turn into e-commerce precisely when an exchange of value occurs (see Mesenbourg, U.S. Department of Commerce, August 2001 for a similar view). We will examine this intersection further in Chapter 12.

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

WHY STUDY E-COMMERCE?

Why are there college courses and textbooks on e-commerce when there are no courses or textbooks on "TV Commerce," "Radio Commerce," "Direct Mail Commerce," "Railroad Commerce," or "Highway Commerce," even though these

technologies had profound impacts on commerce in the twentieth century and account for far more commerce than e-commerce? The reason, as you shall see, is that e-commerce technology (discussed in detail in Chapters 3 and 4) is different and more powerful than any of the other technologies we have seen in the past century. While these other technologies transformed economic life in the twentieth century, the evolving Internet and other information technologies will shape the twenty-first century.

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

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

E-commerce has challenged much of this traditional business thinking. **Table 1.2** lists seven unique features of e-commerce technology that both challenge traditional business thinking and explain why we have so much interest in e-commerce.

SEVEN UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY

Each of the dimensions of e-commerce technology and their business significance listed in Table 1.2 deserves a brief exploration, as well as a comparison to both traditional commerce and other forms of technology-enabled commerce.

Ubiquity

marketplace
physical space you visit in order to transact

ubiquity
available just about everywhere, at all times.

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

In traditional commerce, a **marketplace** is a physical place you visit in order to transact. For example, television and radio typically motivate the consumer to go someplace to make a purchase. E-commerce, in contrast, is characterized by its **ubiquity**: it is available just about everywhere, at all times. It liberates the market from being restricted to a physical space and makes it possible to shop from your desktop, at home, at work, or even from your car, using mobile commerce. The result is called a **marketspace**—a marketplace extended beyond traditional boundaries and removed from a temporal and geographic location. From a consumer point of view, ubiquity reduces *transaction costs*—the costs of participating in a market. To transact, it is no longer necessary that you spend time and money traveling to a market. At a broader level, the ubiquity of e-commerce lowers the cognitive energy required to transact in a marketspace. *Cognitive energy* refers to the mental effort required to complete a task. Humans generally seek to reduce cognitive energy outlays. When given a choice, humans will

TABLE 1.2 SEVEN UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY

E-COMMERCE TECHNOLOGY DIMENSION	BUSINESS SIGNIFICANCE
Ubiquity—Internet/Web technology is available everywhere: at work, at home, and elsewhere via mobile devices, anytime.	The marketplace is extended beyond traditional boundaries and is removed from a temporal and geographic location. "Marketspace" is created; shopping can take place anywhere. Customer convenience is enhanced, and shopping costs are reduced.
Global reach—The technology reaches across national boundaries, around the earth.	Commerce is enabled across cultural and national boundaries seamlessly and without modification. "Marketspace" includes potentially billions of consumers and millions of businesses worldwide.
Universal standards—There is one set of technology standards, namely Internet standards.	There is one set of technical media standards across the globe.
Richness—Video, audio, and text messages are possible.	Video, audio, and text marketing messages are integrated into a single marketing message and consuming experience.
Interactivity—The technology works through interaction with the user.	Consumers are engaged in a dialog that dynamically adjusts the experience to the individual, and makes the consumer a co-participant in the process of delivering goods to the market.
Information density—The technology reduces information costs and raises quality.	Information processing, storage, and communication costs drop dramatically, while currency, accuracy, and timeliness improve greatly. Information becomes plentiful, cheap, and accurate.
Personalization/Customization—The technology allows personalized messages to be delivered to individuals as well as groups.	Personalization of marketing messages and customization of products and services are based on individual characteristics.

choose the path requiring the least effort—the most convenient path (Shapiro and Varian, 1999; Tversky and Kahneman, 1981).

Global Reach

E-commerce technology permits commercial transactions to cross cultural and national boundaries far more conveniently and cost-effectively than is true in traditional commerce. As a result, the potential market size for e-commerce merchants is roughly equal to the size of the world's online population (over 1 billion in 2005, and growing rapidly, according to the Computer Industry

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

Almanac) (Computer Industry Almanac, Inc., 2006). The total number of users or customers an e-commerce business can obtain is a measure of its **reach** (Evans and Wurster, 1997).

In contrast, most traditional commerce is local or regional—it involves local merchants or national merchants with local outlets. Television and radio stations, and newspapers, for instance, are primarily local and regional institutions with limited but powerful national networks that can attract a national audience. In contrast to e-commerce technology, these older commerce technologies do not easily cross national boundaries to a global audience.

Universal Standards

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

One strikingly unusual feature of e-commerce technologies is that the technical standards of the Internet, and therefore the technical standards for conducting e-commerce, are **universal standards**—they are shared by all nations around the world. In contrast, most traditional commerce technologies differ from one nation to the next. For instance, television and radio standards differ around the world, as does cell telephone technology. The universal technical standards of the Internet and e-commerce greatly lower *market entry costs*—the cost merchants must pay just to bring their goods to market. At the same time, for consumers, universal standards reduce *search costs*—the effort required to find suitable products. And by creating a single, one-world marketspace, where prices and product descriptions can be inexpensively displayed for all to see, *price discovery* becomes simpler, faster, and more accurate (Bakos, 1997; Kambil, 1997). And users of the Internet, both businesses and individuals, experience *network externalities*—benefits that arise because everyone uses the same technology. With e-commerce technologies, it is possible for the first time in history to easily find many of the suppliers, prices, and delivery terms of a specific product anywhere in the world, and to view them in a coherent, comparative environment. Although this is not necessarily realistic today for all or many products, it is a potential that will be exploited in the future.

Richness

richness
the complexity and content of a message

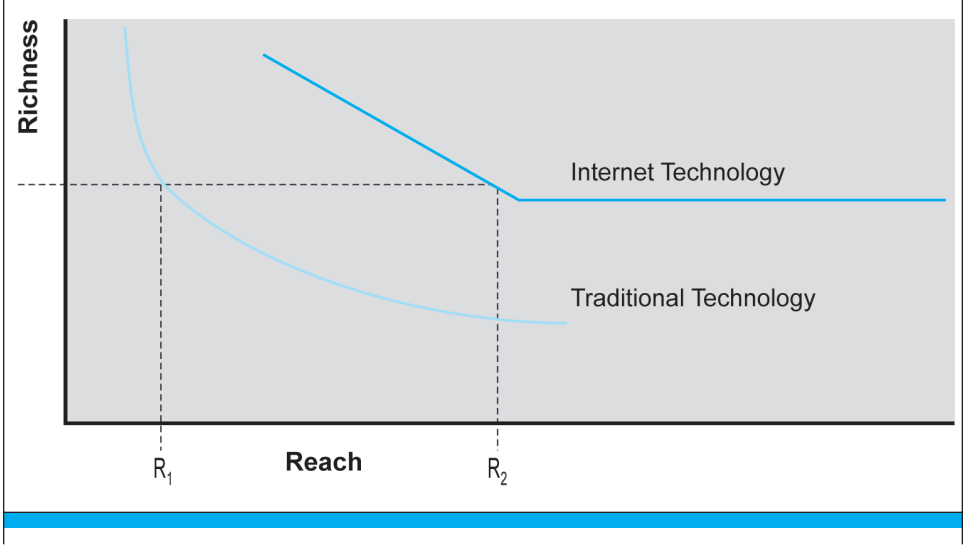
Information **richness** refers to the complexity and content of a message (Evans and Wurster, 1999). Traditional markets, national sales forces, and small retail stores have great richness: they are able to provide personal, face-to-face service using aural and visual cues when making a sale. The richness of traditional markets makes them a powerful selling or commercial environment. Prior to the development of the Web, there was a trade-off between richness and reach: the larger the audience reached, the less rich the message (see **Figure 1.2**).

Interactivity

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

Unlike any of the commercial technologies of the twentieth century, with the possible exception of the telephone, e-commerce technologies allow for **interactivity**, meaning they enable two-way communication between merchant and consumer. Television, for instance, cannot ask viewers any questions or enter into conversations

FIGURE 1.2 **THE CHANGING TRADE-OFF BETWEEN RICHNESS AND REACH**



E-commerce technologies have changed the traditional tradeoff between richness and reach. The Internet and the Web can deliver, to an audience of millions, "rich" marketing messages with text, video, and audio, in a way not possible with traditional commerce technologies such as radio, television, or magazines.
SOURCE: Evans and Wurster, 2000.

with them, and it cannot request that customer information be entered into a form. In contrast, all of these activities are possible on an e-commerce Web site. Interactivity allows an online merchant to engage a consumer in ways similar to a face-to-face experience, but on a much more massive, global scale.

Information Density

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

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

A number of business consequences result from the growth in information density. In e-commerce markets, prices and costs become more transparent. *Price transparency* refers to the ease with which consumers can find out the variety of prices in a market; *cost transparency* refers to the ability of consumers to discover the actual costs merchants pay for products (Sinha, 2000). But there are advantages for merchants as well. Online merchants can discover much more about consumers; this allows merchants to segment the market into groups willing to pay different prices and permits them to engage in *price discrimination*—selling the same goods, or nearly

the same goods, to different targeted groups at different prices. For instance, an online merchant can discover a consumer's avid interest in expensive exotic vacations, and then pitch expensive exotic vacation plans to that consumer at a premium price, knowing this person is willing to pay extra for such a vacation. At the same time, the online merchant can pitch the same vacation plan at a lower price to more price-sensitive consumers (Shapiro and Varian, 1999). Merchants also have enhanced abilities to differentiate their products in terms of cost, brand, and quality.

Personalization/Customization

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

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

E-commerce technologies permit **personalization**: merchants can target their marketing messages to specific individuals by adjusting the message to a person's name, interests, and past purchases. The technology also permits **customization**—changing the delivered product or service based on a user's preferences or prior behavior. Given the interactive nature of e-commerce technology, much information about the consumer can be gathered in the marketplace at the moment of purchase. With the increase in information density, a great deal of information about the consumer's past purchases and behavior can be stored and used by online merchants. The result is a level of personalization and customization unthinkable with existing commerce technologies. For instance, you may be able to shape what you see on television by selecting a channel, but you cannot change the contents of the channel you have chosen. In contrast, the online verson of the *Wall Street Journal* allows you to select the type of news stories you want to see first, and gives you the opportunity to be alerted when certain events happen.

Now, let's return to the question that motivated this section: Why study e-commerce? The answer is simply that e-commerce technologies—and the digital markets that result—promise to bring about some fundamental, unprecedented shifts in commerce. One of these shifts, for instance, appears to be a large reduction in information asymmetry among all market participants (consumers and merchants). In the past, merchants and manufacturers were able to prevent consumers from learning about their costs, price discrimination strategies, and profits from sales. This becomes more difficult with e-commerce, and the entire marketplace potentially becomes highly price competitive.

In addition, the unique dimensions of e-commerce technologies listed in Table 1.2 also suggest many new possibilities for marketing and selling—a powerful set of interactive, personalized, and rich messages are available for delivery to segmented, targeted audiences. E-commerce technologies make it possible for merchants to know much more about consumers and to be able to use this information more effectively than was ever true in the past. Potentially, online merchants could use this new information to develop new information asymmetries, enhance their ability to brand products, charge premium prices for high-quality service, and segment the market into an endless number of subgroups, each receiving a different price. To complicate matters further, these same technologies make it possible for merchants to know more about other merchants than was ever true in the past. This presents the possibility that merchants might collude on prices rather than compete and drive overall average prices up. This strategy works especially well when there are just a

TABLE 1.3 MAJOR TYPES OF E-COMMERCE

TYPE OF E-COMMERCE	EXAMPLE
B2C—Business-to-Consumer	Amazon.com is a general merchandiser that sells consumer products to retail consumers.
B2B—Business-to-Business	ChemConnect.com is a chemical industry exchange that creates an electronic market for chemical producers and users.
C2C—Consumer-to-Consumer	eBay.com creates a marketspace where consumers can auction or sell goods directly to other consumers.
P2P—Peer-to-Peer	Gnutella is a software application that permits consumers to share music with one another directly, without the intervention of a market maker as in C2C e-commerce.
M-commerce—Mobile commerce	Wireless mobile devices such as PDAs (personal digital assistants) or cell phones can be used to conduct commercial transactions.

few suppliers (Varian, 2000b). We examine these different visions of e-commerce—friction-free commerce versus a brand-driven imperfect marketplace—further in Section 1.2 and throughout the book.

TYPES OF E-COMMERCE

There are a variety of different types of e-commerce and many different ways to characterize these types. **Table 1.3** lists the five major types of e-commerce discussed in this book.[1]

For the most part, we distinguish different types of e-commerce by the nature of the market relationship—who is selling to whom. The exceptions are P2P and m-commerce, which are technology-based distinctions.

Business-to-Consumer (B2C) E-commerce

Business-to-Consumer (B2C) e-commerce
online businesses selling to individual consumers

The most commonly discussed type of e-commerce is **Business-to-Consumer (B2C) e-commerce**, in which online businesses attempt to reach individual consumers. Even though B2C is comparatively small ($140–$170 billion in 2005), it has grown exponentially since 1995, and is the type of e-commerce that most consumers are likely to encounter. Within the B2C category, there are many different types of business models. Chapter 2 has a detailed discussion of seven different B2C business mod-

[1]Business-to-Government (B2G) e-commerce can be considered yet another type of e-commerce. For the purposes of this text, we subsume B2G e-commerce within B2B e-commerce, viewing the government as simply a form of business when it acts as a procurer of goods and/or services.

els: portals, online retailers, content providers, transaction brokers, market creators, service providers, and community providers.

Business-to-Business (B2B) E-commerce

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

Business-to-Business (B2B) e-commerce, in which businesses focus on selling to other businesses, is the largest form of e-commerce, with over $1.5 trillion in transactions in the United States in 2005. There was an estimated $13 trillion in business-to-business exchanges of all kinds, online and offline, in 2002, suggesting that B2B e-commerce has significant growth potential (eMarketer, Inc., 2003). The ultimate size of B2B e-commerce could be huge. There are two primary business models used within the B2B arena: Net marketplaces, which include e-distributors, e-procurement companies, exchanges and industry consortia, and private industrial networks, which include single firm networks and industry-wide networks.

Consumer-to-Consumer (C2C) E-commerce

Consumer-to-Consumer (C2C) e-commerce
consumers selling to other consumers

Consumer-to-Consumer (C2C) e-commerce provides a way for consumers to sell to each other, with the help of an online market maker such as the auction site eBay. Given that in 2005, eBay generated more than $44 billion in gross merchandise volume around the world, it is probably safe to estimate that the size of the global C2C market in 2006 will be over $50 billion (eBay, 2006). In C2C e-commerce, the consumer prepares the product for market, places the product for auction or sale, and relies on the market maker to provide catalog, search engine, and transaction-clearing capabilities so that products can be easily displayed, discovered, and paid for.

Peer-to-Peer (P2P) E-commerce

Peer-to-peer technology enables Internet users to share files and computer resources directly without having to go through a central Web server. In peer-to-peer's purest form, no intermediary is required, although in fact, most P2P networks make use of intermediary "super servers" to speed operations. Since 1999, entrepreneurs and venture capitalists have attempted to adapt various aspects of peer-to-peer technology into **Peer-to-Peer (P2P) e-commerce**. To date there have been very few successful commercial applications of P2P e-commerce with the notable exception of illegal downloading of copyrighted music.

Peer-to-Peer (P2P) e-commerce
use of peer-to-peer technology, which enables Internet users to share files and computer resources directly without having to go through a central Web server, in e-commerce

Napster.com, which was established to aid Internet users in finding and sharing online music files, was the most well-known example of peer-to-peer e-commerce until it was put out of business in 2001 by a series of negative court decisions. However, other file-sharing networks, such as Kazaa and Grokster, quickly emerged to take Napster's place. These networks have also been subjected to legal challenge. For instance, in 2002, the Recording Industry of America, a trade organization of the largest recording companies, filed a federal lawsuit against Kazaa and Grokster for violating copyright law by enabling and encouraging members to exchange copyrighted music tracks without compensation to the copyright holders. The Supreme Court issued a decision in the case against the file-sharing networks in June 2005. Read the case study at the end of the chapter for a further look at how file-sharing networks work and the legal issues surrounding them.

Mobile Commerce (M-commerce)

Mobile commerce, or **m-commerce**, refers to the use of wireless digital devices to enable transactions on the Web. Described more fully in Chapter 3, m-commerce involves the use of wireless networks to connect cell phones, handheld devices such Blackberries, and personal computers to the Web. Once connected, mobile consumers can conduct transactions, including stock trades, in-store price comparisons, banking, travel reservations, and more. Thus far, m-commerce is used most widely in Japan and Europe (especially in Scandinavia), where cell phones are more prevalent than in the United States; however, as discussed in the next section, m-commerce is expected to grow rapidly in the United States over the next five years.

mobile commerce (m-commerce)
use of wireless digital devices to enable transactions on the Web

GROWTH OF THE INTERNET AND THE WEB

The technology juggernauts behind e-commerce are the Internet and the World Wide Web.

Without both of these technologies, e-commerce as we know it would be impossible. We describe the Internet and the Web in some detail in Chapter 3. The **Internet** is a worldwide network of computer networks built on common standards. Created in the late 1960s to connect a small number of mainframe computers and their users, the Internet has since grown into the world's largest network, connecting over 500 million computers worldwide. The Internet links businesses, educational institutions, government agencies, and individuals together, and provides users with services such as e-mail, document transfer, newsgroups, shopping, research, instant messaging, music, videos, and news.

Internet
Worldwide network of computer networks built on common standards

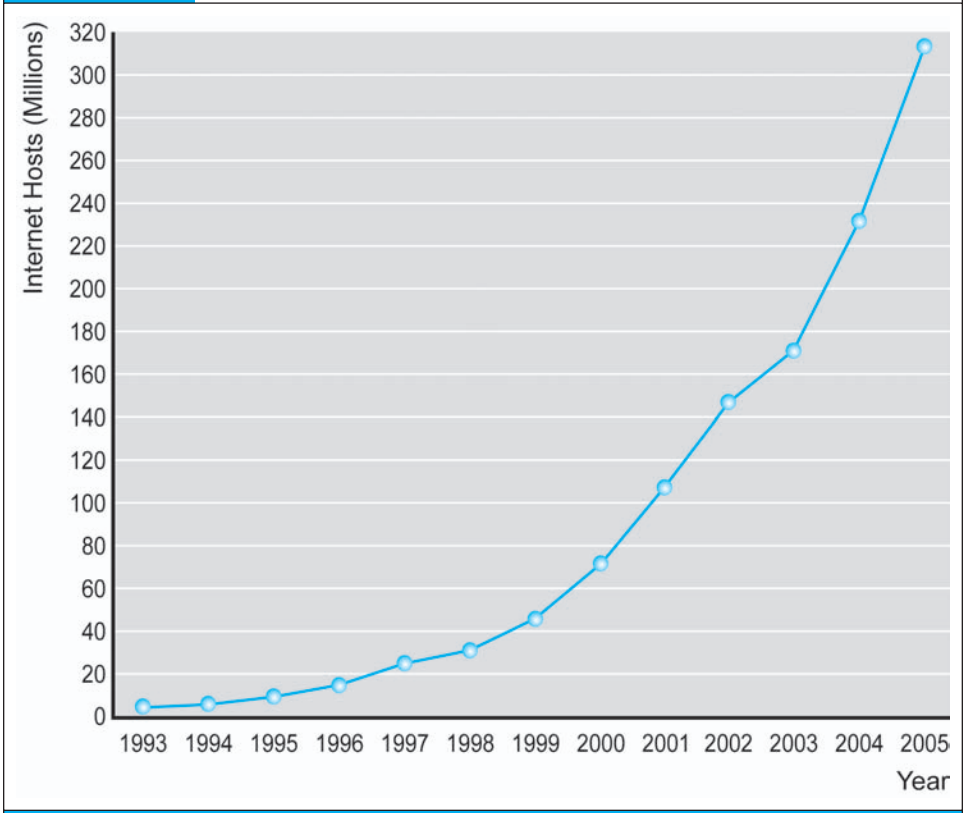
Figure 1.3 illustrates one way to measure the growth of the Internet, by looking at the number of Internet hosts with domain names. (An *Internet host* is defined by the Internet Software Consortium, which conducts this survey, as any IP address that returns a domain name in the in-addr.arpa domain, which is a special part of the DNS namespace that resolves IP addresses into domain names.) In January 2005, there were over 317 million Internet hosts in over 245 countries, up from a mere 70 million in 2000. The number of Internet hosts has been growing at a rate of around 35% a year since 2000 (Internet Systems Consortium, Inc., 2005).

The Internet has shown extraordinary growth patterns when compared to other electronic technologies of the past. It took radio 38 years to achieve a 30% share of U.S. households. It took television 17 years to achieve a 30% share. Since the invention of a graphical user interface for the World Wide Web in 1993, it took only 10 years for the Internet/Web to achieve a 53% share of U.S. households.

The **World Wide Web** (the **Web**) is the most popular service that runs on the Internet infrastructure. The Web is the "killer application" that made the Internet commercially interesting and extraordinarily popular. The Web was developed in the early 1990s and hence is of much more recent vintage than the Internet. We describe the Web in some detail in Chapter 3. The Web provides easy access to over 8 billion Web pages created in a language called *HTML (HyperText Markup Language)*. These HTML pages contain information—including text, graphics, animations, and other

World Wide Web (Web)
the most popular service that runs on the Internet; provides easy access to Web pages

FIGURE 1.3 **THE GROWTH OF THE INTERNET, MEASURED BY NUMBER OF INTERNET HOSTS WITH DOMAIN NAMES**

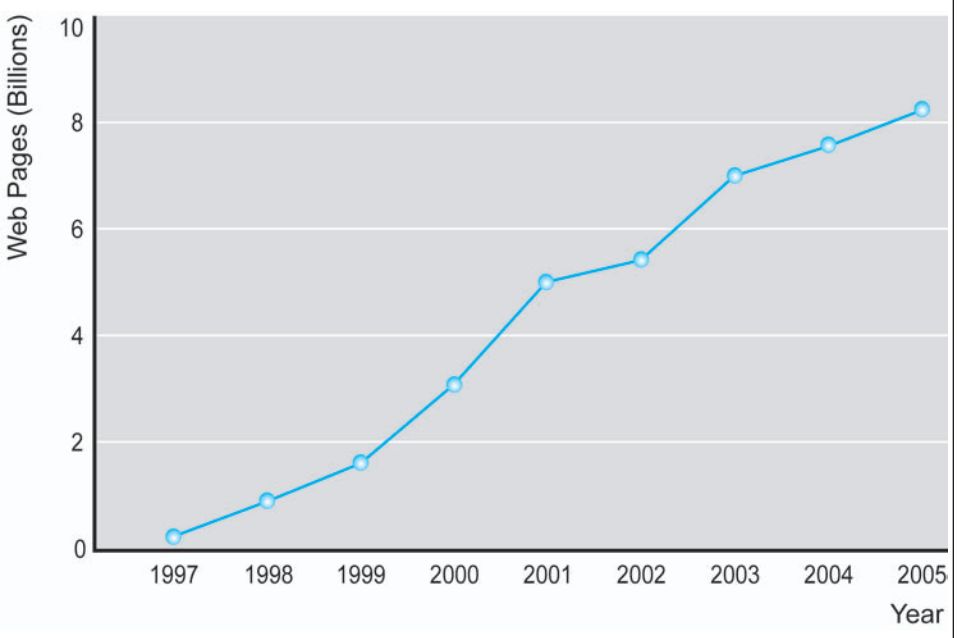


Growth in the size of the Internet 1993-2005 as measured by the number of Internet hosts with domain names.
SOURCE: Internet Systems Consortium, Inc. (www.isoc.org), 2005.

objects—made available for public use. You can find an exceptionally wide range of information on Web pages, ranging from the entire catalog of Sears Roebuck, to the entire collection of public records from the Securities and Exchange Commission, to the card catalog of your local library, to millions of music tracks (some of them legal), and videos. The Internet prior to the Web was primarily used for text communications, file transfers, and remote computing. The Web introduced far more powerful and commercially interesting, colorful multimedia capabilities of direct relevance to commerce. In essence, the Web added color, voice, and video to the Internet, creating a communications infrastructure and information storage system that rivals television, radio, magazines, and even libraries.

There is no precise measurement of the number of Web pages in existence, in part because today's search engines index only a portion of the known universe of Web pages, and also because the size of the Web universe is unknown. Google, the Web's most popular and perhaps most comprehensive Web search engine, currently

FIGURE 1.4 **THE GROWTH OF WEB CONTENT AS MEASURED BY PAGES INDEXED BY GOOGLE**



The number of Web pages indexed by Google has grown from about 1 billion in 1998 to over 8 billion in 2005.

SOURCE: Based on data from Google Inc., 2005.

indexes over 8 billion pages. There are also an estimated 600 billion Web pages in the so-called "deep Web" that are not indexed by ordinary search engines such as Google. Nevertheless, it would be accurate to say that Web content has grown exponentially since 1993. **Figure 1.4** describes the growth of Web content measured by the number of pages indexed by Google.

Read *Insight on Technology: Spider Webs, Bow Ties, Scale-Free Networks, and the Deep Web* on pages 22–23 for the latest view of researchers on the structure of the Web.

ORIGINS AND GROWTH OF E-COMMERCE

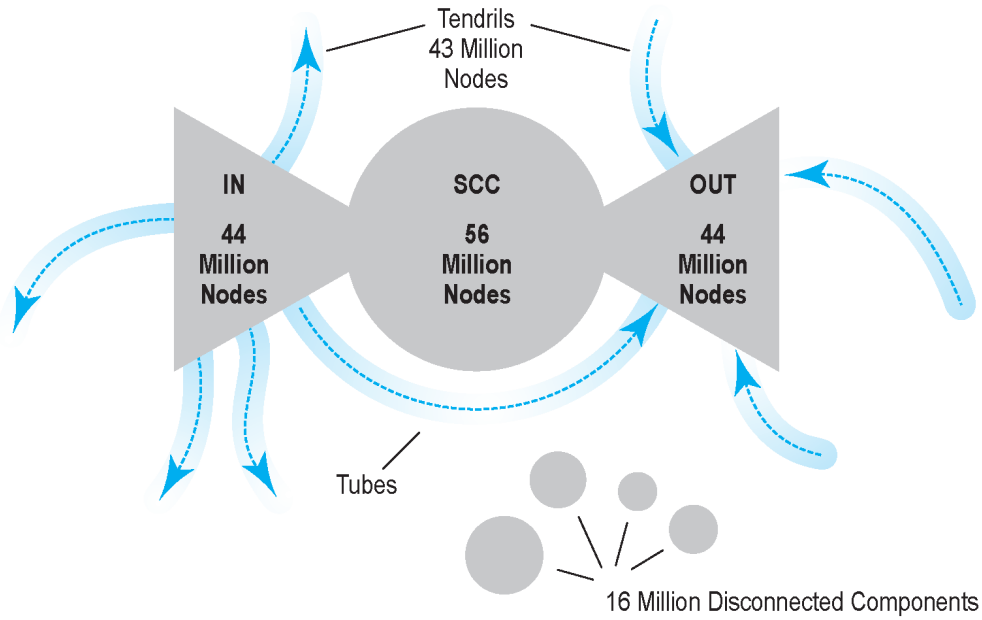
It is difficult to pinpoint just when e-commerce began. There were several precursors to e-commerce. In the late 1970s, a pharmaceutical firm named Baxter Healthcare initiated a primitive form of B2B e-commerce by using a telephone-based modem that permitted hospitals to reorder supplies from Baxter.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

INSIGHT ON TECHNOLOGY

SPIDER WEBS, BOW TIES, SCALE-FREE NETWORKS, AND THE DEEP WEB

The World Wide Web conjures up images of a giant spider web where everything is connected to everything else in a random pattern, and you can go from one edge of the web to another by just following the right links. Theoretically, that's what makes the Web different from a typical index system—you can follow hyperlinks from one page to another. In the "small world" theory of the Web, every Web page is thought to be separated from any other Web page by an average of about 19 clicks. In 1968, sociologist Stanley Milgram invented small-world theory for social networks by noting that every human was separated from any other human by only six degrees of separation. On the Web, the small world theory was supported by early research on a small sampling of Web sites. But recent research conducted jointly by scientists at IBM, Compaq, and AltaVista found something entirely different. These scientists used AltaVista's Web crawler "Scooter" to identify 200 million Web pages and follow 1.5 billion links on these pages.

The researchers discovered that the Web was not like a spider web at all, but rather like a bow tie (see figure below). The bow-tie Web had a "strongly connected component" (SCC) composed of about 56 million Web pages. On the right side of the bow tie was a set of 44 million OUT pages that you could get to from the center, but could not return to the center from. OUT pages tended to be corporate intranet and other



(continued)

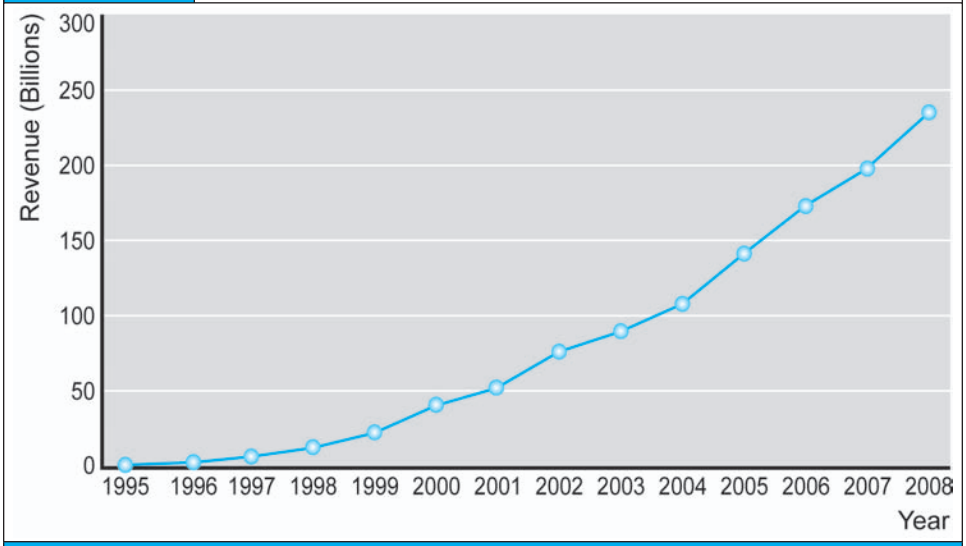
Web site pages that are designed to trap you at the site when you land. On the left side of the bow tie was a set of 44 million IN pages from which you could get to the center, but that you could not travel to from the center. These were recently created "newbie" pages that had not yet been linked to by many center pages. In addition, 43 million pages were classified as "tendrils," pages that did not link to the center and could not be linked to from the center. However, the tendril pages were sometimes linked to IN and/or OUT pages. Occasionally, tendrils linked to one another without passing through the center (these are called "tubes"). Finally, there were 16 million pages totally disconnected from everything.

Further evidence for the non-random and structured nature of the Web is provided in research performed by Albert-Lazlo Barabasi at the University of Notre Dame. Barabasi's team found that far from being a random, exponentially exploding network of 8 billion Web pages, activity on the Web was actually highly concentrated in "very connected super nodes" that provided the connectivity to less well-connected nodes. Barabasi dubbed this type of network a "scale-free" network and found parallels in the growth of cancers, disease transmission, and computer viruses. As its turns out, scale-free networks are highly vulnerable to destruction. Destroy their super nodes and transmission of messages breaks down rapidly. On the upside, if you are a marketer trying to "spread the message" about your products, place your products on one of the super nodes and watch the news spread. Or build super nodes like Kazaa did (see the case study at the end of the chapter) and attract a huge audience.

Thus, the picture of the Web that emerges from this research is quite different from earlier reports. The notion that most pairs of Web pages are separated by a handful of links, almost always under 20, and that the number of connections would grow exponentially with the size of the Web, is not supported. In fact, there is a 75% chance that there is no path from one randomly chosen page to another. With this knowledge, it now becomes clear why the most advanced Web search engines only index about 6 million Web sites, when the overall population of Internet hosts is over 300 million. Most Web sites cannot be found by search engines because their pages are not well-connected or linked to the central core of the Web. Another important finding is the identification of a "deep Web" composed of over 600 billion Web pages that are not indexed at all. The pages are not easily accessible to Web crawlers that most search engine companies use. Instead, these pages are either proprietary (not available to crawlers and non-subscribers, such as the pages of the *Wall Street Journal*) or are not easily available from home pages. In the last few years, new search engines (such as the medical search engine Mamma.com) and older ones such as Yahoo! have been revised to enable them to search the deep Web. Because e-commerce revenues in part depend on customers being able to find a Web site using search engines, Web site managers need to take steps to ensure their Web pages are part of the connected central core, or super nodes of the Web. One way to do this is to make sure the site has as many links as possible to and from other relevant sites, especially to other sites within the SCC.

SOURCES: "Deep Web Research," by Marcus P. Zillman, Llrx.com, July 2005; "Momma.com Conquers Deep Web," Mammamediasolutions.com, June 20, 2005; "Yahoo Mines the 'Deep Web,'" by Tim Gray, Internetnews.com, June 17, 2005; *Linked: The New Science of Networks* by Albert-Lazlo Barabasi. Cambridge, MA: Perseus Publishing (2002); "The Bowtie Theory Explains Link Popularity," by John Heard, Searchengineposition.com, June 1, 2000; "Graph Structure in the Web," by A. Broder, R. Kumar, F. Maghoul, P. Raghaven, S. Rajagopalan, R. Stata, A. Tomkins, and J. Wiener, Proceedings of the 9th International World Wide Web Conference, Amsterdam, The Netherlands, pages 309–320. Elsevier Science, May 2000.

FIGURE 1.5 THE GROWTH OF B2C E-COMMERCE



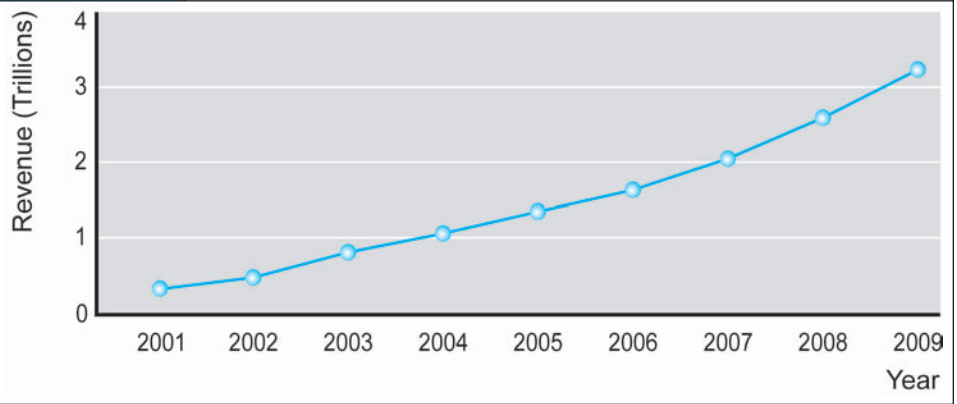
In the early years, B2C e-commerce was doubling or tripling each year. This explosive early growth rate has since slowed. Currently, B2C e-commerce is growing at about 25% per year, with seasonal spikes showing stronger year-to-year gains. [Note: Revenue shown includes retail sales, travel and financial services revenues.]
SOURCES: Based on data from eMarketer, Inc., 2005a; Shop.org and Forrester Research, 2005; Forrester Research, 2004.

standards that permitted firms to exchange commercial documents and conduct digital commercial transactions across private networks.

In the B2C arena, the first truly large-scale digitally enabled transaction system was deployed in France in 1981. The French Minitel was a videotext system that combined a telephone with an 8-inch screen. By the mid-1980s, more than 3 million Minitels were deployed, and today there are about 6 million in use throughout France. Over 13,000 different services can be found on Minitel, including ticket agencies, travel services, retail products, and online banking. No credit cards are needed because purchases are charged to the monthly telephone bill, and there are no hackers, viruses, or worms because it is a private network owned by France Telecom (Arnold, 2003).

However, none of these precursor systems had the functionality of the Internet. Generally, when we think of e-commerce today, it is inextricably linked to the Internet. For our purposes, we will say e-commerce begins in 1995, following the appearance of the first banner advertisements placed by ATT, Volvo, Sprint, and others on Hotwired.com in late October 1994, and the first sales of banner ad space by Netscape and Infoseek in early 1995. Since then, e-commerce has been the fastest growing form of commerce in the United States. **Figures 1.5** and **1.6** chart the development of B2C e-commerce and B2B e-commerce, respectively, with projections for the next several years. Both graphs show a strong projected growth rate, but the dollar amounts of B2B e-commerce dwarf those of B2C.

FIGURE 1.6 THE GROWTH OF B2B E-COMMERCE



B2B e-commerce is about ten times the size of B2C e-commerce. In 2009, B2B e-commerce is projected to be about $3 trillion. [Note: Does not include EDI transactions.]

SOURCES: Based on data from eMarketer, Inc., 2003; U.S. Department of Commerce, 2005; authors' estimates.

TECHNOLOGY AND E-COMMERCE IN PERSPECTIVE

Although in many respects, e-commerce is new and different, it is also important to keep e-commerce in perspective. First, the Internet and the Web are just two of a long list of technologies that have greatly changed commerce in the United States and around the world. Each of these other technologies spawned business models and strategies designed to leverage the technology into commercial advantage and profit. They were also accompanied by explosive early growth, which was characterized by the emergence of thousands of entrepreneurial start-up companies, followed by painful retrenchment, and then a long-term successful exploitation of the technology by larger established firms. In the case of automobiles, for instance, in 1915, there were over 250 automobile manufacturers in the United States. By 1940, there were five. In the case of radio, in 1925, there were over 2,000 radio stations across the United States, with most broadcasting to local neighborhoods and run by amateurs. By 1990, there were fewer than 500 independent stations. There is every reason to believe e-commerce will follow the same pattern—with notable differences discussed throughout the text.

Second, although e-commerce has grown explosively, there is no guarantee it will continue to grow forever at these rates and much reason to believe e-commerce growth will cap as it confronts its own fundamental limitations. For instance, B2C e-commerce is still a small part (about 3%) of the overall retail market. Under current projections, in 2008, all of B2C e-commerce will roughly equal the annual revenue of Wal-Mart—the world's largest and most successful retailer. On the other hand, with only 3% of all retail sales now taking place online, there is tremendous upside potential.

TABLE 1.4 LIMITATIONS ON THE GROWTH OF B2C E-COMMERCE

LIMITING FACTOR	COMMENT
Expensive technology	Using the Internet requires a $400 PC (minimal) and a connect charge ranging from about $10 to $60 depending on the speed of service.
Sophisticated skill set	The skills required to make effective use of the Internet and e-commerce capabilities are far more sophisticated than, say, for television or newspapers.
Persistent cultural attraction of physical markets and traditional shopping experiences	For many, shopping is a cultural and social event where people meet directly with merchants and other consumers. This social experience has not yet been fully duplicated in digital form (although social shopping is a major new development).
Persistent global inequality limiting access to telephones and personal computers	Much of the world's population does not have telephone service, PCs, or cell phones.

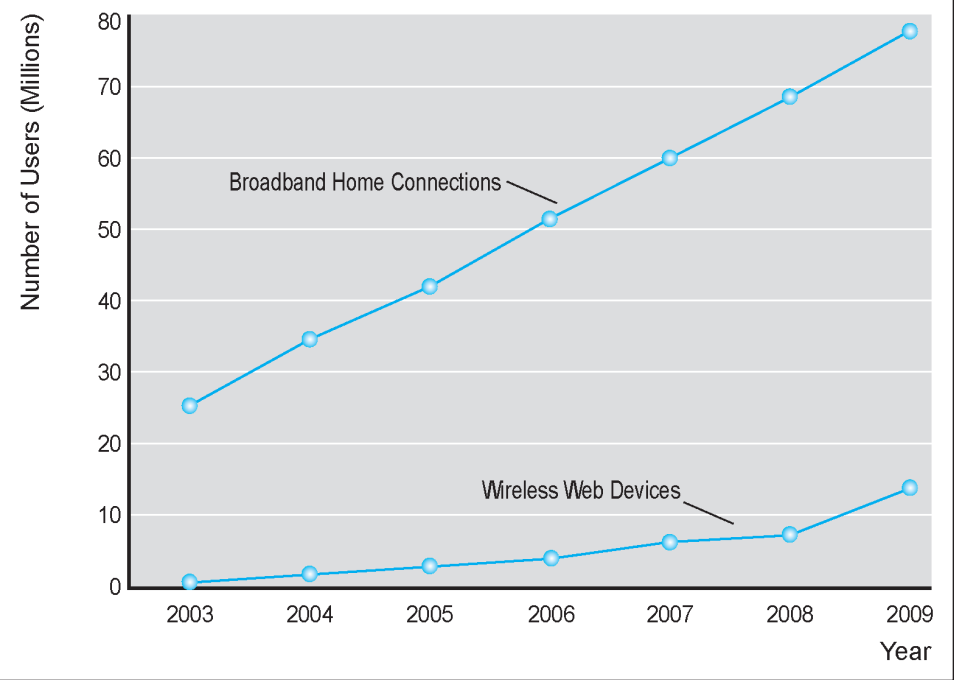
POTENTIAL LIMITATIONS ON THE GROWTH OF B2C E-COMMERCE

There are several limitations on B2C e-commerce that have the potential to cap its growth rate and ultimate size. **Table 1.4** describes some of these limitations.

Some of these limitations may be eradicated in the next decade. For instance, it is likely that the price of entry-level PCs will fall to $200 by the year 2009. This, coupled with enhancements in capabilities such as integration with television, access to entertainment film libraries on a pay-per-view basis, and other software enhancements, will likely raise U.S. Internet household penetration rates to the level of cable television penetration (about 80%) by 2009. The PC operating system will also likely evolve from the current Windows platform to far simpler choice panels similar to the interface found on Palm handheld devices.

The most significant technology that can reduce barriers to Internet access is wireless Web technology (described in more detail in Chapter 3). Today, consumers can access the Internet via a variety of different mobile devices, such as mobile computers, cell phones, smart phones, two-way pagers such as Blackberries and personal digital assistants. In 2005, there were approximately 68.5 million mobile computers in use in the United States, a number that is expected to grow to 125 million in 2010 (Computer Industry Almanac, Inc, 2005). There were almost 200 million mobile phone subscribers in the United States in 2005 (eMarketer, Inc., 2005c). PDA and two-way pager vendors shipped over 14 million units worldwide in 2005, the majority to the United States (eMarketer, Inc., 2005d). And all of these devices will become even more useful as Internet devices than they already are as wireless broadband technologies continue to expand. **Figure 1.7** illustrates the extremely rapid growth projected for both broadband home connections and wireless Web devices in the United States.

FIGURE 1.7 **GROWTH PROJECTIONS FOR BROADBAND HOME CONNECTIONS AND WIRELESS WEB DEVICES IN THE UNITED STATES**



About 40 million households (34% of all households) now have broadband Web access. Wireless Web devices (both fixed and mobile) are growing at nearly 100% per year. Both of these developments provide a significant stimulus to e-commerce.

SOURCES: Based on data from eMarketer, Inc. 2005e; 2005f; authors' estimates.

On balance, the current technological limits on e-commerce growth, while real, are likely to recede in importance over the next decade. The social and cultural limitations of e-commerce are less likely to change as quickly, but the Web is fast developing virtual social shopping experiences and virtual realities that millions find as entertaining as shopping at the mall.

1.2 E-COMMERCE: A BRIEF HISTORY

Although e-commerce is a very recent phenomenon of the late 1990s, it already has a brief, tumultuous history. The early years of e-commerce were a period of explosive growth and extraordinary innovation, beginning in 1995 with the first widespread use of the Web to advertise products. This period of explosive growth was capped in March 2000 when stock market valuations for dot.com companies reached their peak and thereafter began to collapse. A sobering period of reassessment occurred, followed by strong double-digit growth through the current period.

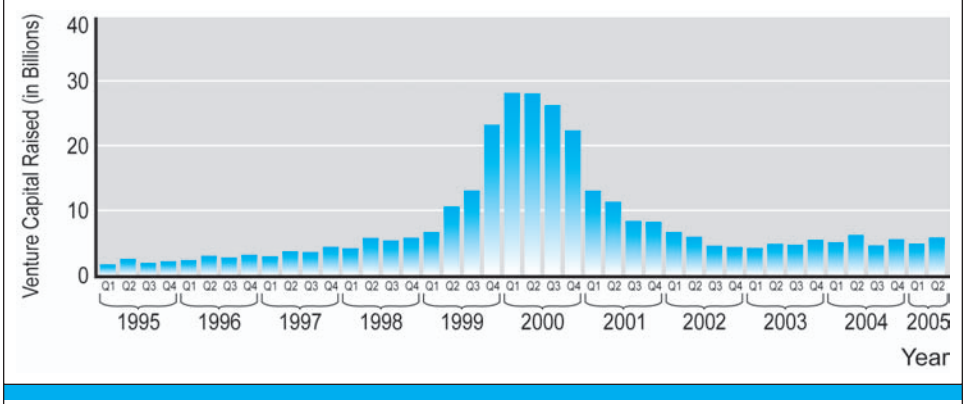
THE VISIONS AND FORCES BEHIND E-COMMERCE: 1995–2000

The early years of e-commerce were one of the most euphoric of times in American commercial history. It was also a time when key e-commerce concepts were developed and explored. Thousands of dot.com companies were formed, backed by over $125 billion in financial capital—one of the largest outpourings of venture capital in United States history (PricewaterhouseCoopers, 2005). **Figure 1.8** depicts the amounts invested by venture capital firms in the period 1995–2005. About 80% of this investment was in Internet-related industries. While venture investment has trended markedly lower since 2000, it is still twice as large as 1995 levels, and investing in dot.com and Internet businesses continues at a strong pace in 2005. By 2004, dot.com IPOs were again being successfully floated on Wall Street, encouraged by Google's successful IPO in 2004, which raised more than $1.67 billion, and the fact that Google shares have since shot up from its offering price of $85 to nearly $300. In 2004–2005, shares of companies involved in online retailing rose 80% over their 2003 prices (Stein, 2005).

For computer scientists and information technologists, the early success of e-commerce was a powerful vindication of a set of information technologies that had developed over a period of forty years—extending from the development of the early Internet to the PC, to local area networks. The vision was of a universal communications and computing environment that everyone on earth could access with cheap, inexpensive computers—a worldwide universe of knowledge stored on HTML pages created by hundreds of millions of individuals and thousands of libraries, governments, and scientific institutes. Technologists celebrated the fact that the Internet was not controlled by anyone or any nation, but was free to all. They believed the Internet—and the e-commerce that rose on this infrastructure—should remain a self-governed, self-regulated environment.

For economists, the early years of e-commerce raised the realistic prospect of a perfect *Bertrand market*: where price, cost, and quality information is equally distributed, a nearly infinite set of suppliers compete against one another, and customers have access to all relevant market information worldwide. The Internet would spawn digital markets where information would be nearly perfect—something that is rarely true in other real-world markets. Merchants in turn would have equal direct access to hundreds of millions of customers. In this near-perfect information marketspace, transaction costs would plummet because search costs—the cost of searching for prices, product descriptions, payment settlement, and order fulfillment—would all fall drastically (Bakos, 1997). New shopping bot programs would automatically search the entire Web for the best prices and delivery times. For merchants, the cost of searching for customers would also fall, reducing the need for wasteful advertising. At the same time, advertisements could be personalized to the needs of every customer. Prices and even costs would be increasingly transparent to the consumer, who could now know exactly and instantly the worldwide best price, quality, and availability of most products. Information asymmetry would be greatly reduced. Given the instant nature of Internet communications, the availability of powerful sales information systems, and the low cost involved in changing prices on a Web site (low menu costs), producers could dynamically price their products to

FIGURE 1.8 **QUARTERLY AMOUNTS RAISED BY VENTURE-BACKED FIRMS**



The quarterly amounts raised by venture-backed firms peaked during the 1999–2001 period, but the amount raised in the 2002–2005 period is still higher than that raised in the periods prior to 1999.
SOURCE: Based on data from MoneyTree™ Survey, 2005.

reflect actual demand, ending the idea of one national price, or one suggested manufacturer's list price. In turn, market middlemen—the distributors, wholesalers, and other factors in the marketplace who are intermediates between producers and consumers, each demanding a payment and raising costs while adding little value—would disappear (**disintermediation**). Manufacturers and content originators would develop direct market relationships with their customers. The resulting intense competition, the decline of intermediaries, and the lower transaction costs would eliminate product brands, and along with it, the possibility of *monopoly profits* based on brands, geography, or special access to factors of production. Prices for products and services would fall to the point where prices covered costs of production plus a fair, "market rate" of return on capital, plus additional small payments for entrepreneurial effort (that would not last long). Unfair competitive advantages (which occur when one competitor has an advantage others cannot purchase) would be eliminated, as would extraordinary returns on invested capital. This vision was called **friction-free commerce** (Smith et al., 2000).

For real-world entrepreneurs, their financial backers, and marketing professionals, the idea of friction-free commerce was far from their own visions. For these players, e-commerce represented an extraordinary opportunity to earn far above normal returns on investment, far above the cost of borrowing capital. The e-commerce marketspace represented access to millions of consumers worldwide who used the Internet and a set of marketing communications technologies (e-mail and Web pages) that was universal, inexpensive, and powerful. These new technologies would permit marketers to practice what they always had done—segmenting the market into groups with different needs and price sensitivity, targeting the segments with branding and promotional messages,

disintermediation
displacement of market middlemen who traditionally are intermediaries between producers and consumers by a new direct relationship between manufacturers and content originators with their customers

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

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

and positioning the product and pricing for each group—but with even more precision. In this new marketspace, extraordinary profits would go to **first movers**—those firms who were first to market in a particular area and who moved quickly to gather market share. First movers could establish a large customer base quickly, build brand name recognition early, create an entirely new distribution channel, and then inhibit competitors (new entrants) by building in *switching costs* for their customers through proprietary interface designs and features available only at one site. Online businesses using the new technology could create informative, community-like features unavailable to traditional merchants. These "communities of consumption" also would add value and be difficult for traditional merchants to imitate. The thinking was that once customers became accustomed to using a company's unique Web interface and feature set, they could not easily be switched to competitors. In the best case, the entrepreneurial firm would invent proprietary technologies and techniques that almost everyone adopted, creating a **network effect**. A network effect occurs where all participants receive value from the fact that everyone else uses the same tool or product (for example, a common operating system, telephone system, or software application such as instant messaging), all of which increase in value as more people adopt them.[2] Successful first movers would become the new intermediaries of e-commerce, displacing traditional retail merchants and suppliers of content, and becoming profitable by charging fees of one sort or another for the value customers perceived in their services and products.

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

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

Thus, the early years of e-commerce were driven largely by visions of profiting from new technology, with the emphasis on quickly achieving very high market visibility. The source of financing was venture capital funds. The ideology of the period emphasized the ungoverned "Wild West" character of the Web and the feeling that governments and courts could not possibly limit or regulate the Internet; there was a general belief that traditional corporations were too slow and bureaucratic, too stuck in the old ways of doing business, to "get it"—to be competitive in e-commerce. Young entrepreneurs were therefore the driving force behind e-commerce, backed by

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

huge amounts of money invested by venture capitalists. The emphasis was on *deconstructing* (destroying) traditional distribution channels and disintermediating existing channels, using new pure online companies who aimed to achieve impregnable first mover advantages. Overall, this period of e-commerce was characterized by experimentation, capitalization, and hypercompetition (Varian, 2000a). Read *Insight on Business:* A *Short History of Dot.com IPOs* for a further look at the financing of e-commerce ventures.

ASSESSING E-COMMERCE: SUCCESSES, SURPRISES, AND FAILURES

The crash in stock market values for e-commerce throughout 2000 is a convenient marker for ending the early period in the development of e-commerce. Looking back at the first years of e-commerce, it is apparent that e-commerce has been, for the most part, a stunning technological success as the Internet and the Web ramped up from a few thousand to billions of e-commerce transactions per year, generating $140–$170 billion in B2C revenues and around $1.5 trillion in B2B revenues in 2005, with around 110 million online buyers in the United States, and another 100 million worldwide. With enhancements and strengthening, described in later chapters, it is clear the e-commerce's digital infrastructure is solid enough to sustain significant growth in e-commerce during the next decade. The Internet scales well. The "e" in e-commerce has been an overwhelming success.

From a business perspective, though, the early years of e-commerce were a mixed success, and offered many surprises. Only about 10% of dot.coms formed since 1995 survived as independent companies in 2005. Only a very tiny percentage of these survivors are profitable. Yet online B2C sales of goods and services are still growing at 25% per year (depending on the source of the projection). B2C revenues are expected to grow from $140–$170 billion in 2005 (about 3% of all retail revenue) to around $232 billion in 2008 (about 8% of total retail sales). In addition, consumers have learned to use the Web as a powerful source of information about products they actually purchase through other channels, such as at a traditional "bricks-and-mortar" store. This is especially true of expensive consumer durables such as appliances, automobiles, and electronics. This "Internet-influenced" commerce is projected to grow to $378 billion by 2007. Altogether then, B2C e-commerce (both actual purchases and purchases influenced by Web shopping but actually buying in a store) could amount to over $500 billion in 2007, about 18.5% of total retail sales (eMarketer, Inc., 2005a; Forrester Research, Inc., 2003). The "commerce" in e-commerce is basically very sound, at least in the sense of attracting a growing number of customers and generating revenues.

Although e-commerce today continues an extremely rapid pace of growth in customers and revenues, it is clear that many of the visions, predictions, and assertions of e-commerce developed in the early years have not been fulfilled. For instance, economists' visions of "friction-free" commerce have not been entirely realized. Prices are sometimes lower on the Web, but the low prices are sometimes a function of entrepreneurs selling products below their costs. Consumers are less price sensitive than expected; surprisingly, the Web sites with the highest revenue often have the highest prices. There remains considerable per-

INSIGHT ON BUSINESS

A SHORT HISTORY OF DOT.COM IPOS

E-commerce was built on Internet technology, but what made it run was money—big money. Between 1998 and 2000, venture capitalists poured an estimated $120 billion into approximately 12,450 dot.com start-up ventures. Investment bankers then took 1,262 of these companies public in what is called an initial public offering (IPO) of stock. To prepare for an IPO, investment bankers analyze a company's finances and business plans and attempt to arrive at an estimate of how much the company is worth—how much the investing public might be willing to pay for the shares and how many shares might be purchased by the public and other institutions. The bankers then underwrite the stock offering and sell the stock on a public stock exchange, making enormous fees for underwriting in the process.

In the early years of e-commerce, from 1998 to 2000, dot.com IPO shares often skyrocketed within minutes of hitting the trading floor. Some shares tripled and quadrupled in the first day, and a 50% "pump" (or increase in value) was considered just a reasonable showing. IPO shares for dot.com companies were often targeted to open at around $15 per share, and it was not uncommon for them to be trading at $45 a share or even much more later the same day. Therefore, getting in on the ground floor of an IPO—which meant arranging to purchase a fixed number of shares prior to actual trading on the first day—was a privilege reserved for other large institutions, friends of the investment bankers, or other investment bankers. In what was called "stock spinning," the underwriter would sell IPO shares to entrepreneurs it hoped to obtain business from in the future. The Securities and Exchange Commission made this practice illegal in 1999.

What has happened to the dot.com IPOs of this period? According to a financial services research firm, Thomson Financial, 12% of the companies that went public between 1998 and 2000 were trading at $1 or less a share in April 2001, a fairly shocking development when one considers that just a relatively short time previously, those companies' shares were trading at upwards of 10 to 100 times that price. Among the companies that fell below $1 in share price were Autoweb.com, iVillage.com, and Drugstore.com. In mid-2005, Autoweb.com merged with Autobytel.com and the combined company sells for about $4 a share; iVillage still exists and sells for $8, and Drugstore.com sells in the $2–$4 range. Each of these companies is showing strong growth (10% a year or more).

In 2005, five years after the peak of the dot.com frenzy, at least 5,000 Internet companies have either been acquired or shut down. But well over $200 billion has poured into the dot.com sector during this period for the purchase of over 4,000 Web companies, initiating a second wave of dot.com investment. What are the investors buying this time? In 2005, hot properties have included Internet shopping sites (such as Shopping.com, purchased for $620 million by eBay and Shopzilla.com, purchased for $525 million by The E.W. Scripps Company), Internet advertising firms (such as DoubleClick, purchased for $1.1 billion by buyout firm Hellman & Friedman), search engine properties (such as Ask Jeeves, purchased by IAC/InterActive Corp for $1.85 billion), and community sites (such as About.com, purchased by The New York Times for $410 million, and Intermix, owner of the social networking site MySpace.com, purchased by News Corp.'s Fox Interactive Media division for $580 million).

(continued)

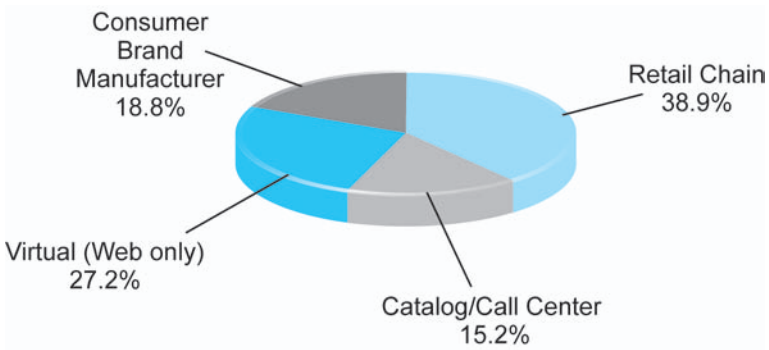
The IPO market is also sizzling hot again. In 2004, there more IPOs than in all of 2002–2003 combined! These IPOs provided an average return to investors of 21% in the year. Almost 40% of the companies were not profitable when they went public, but this is a lot better than the 74% of companies that were not profitable prior to their IPO in 2000. The shakeout in dot.com industry is over, and the decks are cleared for a second wave of rapid but hopefully saner growth in Internet investments based on the positive earnings of successful mainstream dot.com companies.

SOURCES: "Shopping That Really Sells," BizReport, June 9, 2005; "Those IPO's are Sizzling Hot. Uh-Oh," by Gary Rivlin, *New York Times*, January 8, 2005; "Internet Returns as Active Sector," by Raymond Hennessey, *New York Times*, November 8, 2004; "The Return of the Venture Capitalists," by Anne Field, *New York Times*, September 2, 2004; "Internet Companies Three Years After the Height of the Bubble," Webmergers.com, March 2003.

sistent and even increasing price dispersion on the Web: the difference between the lowest price and the average price for a basket of goods increased from 8% of the average price in 2000 to 11% in 2006 (Nash-equilibrium.com, 2006). The concept of one world, one market, one price has not occurred in reality as entrepreneurs discover new ways to differentiate their products and services. While for the most part Internet prices save consumers about 20% on average when compared to in-store prices, sometimes prices on the Web are higher than for similar products purchased off line, especially if shipping costs are considered. For instance, prices on books and CDs vary by as much as 50%, prices for airline tickets as much as 20% (Baye and Morgan, 2004; Baye, et. al., 2004; Bailey, 1998a, b; Brynjolfsson and Smith, 2001). Merchants have adjusted to the competitive Internet environment by engaging in "hit and run pricing" or changing prices every day or hour so competitors never know what they are charging (neither do customers); by making their prices hard to discover and sowing confusion among consumers by "baiting and switching" customers from low-margin products to high-margin products with supposedly "higher quality." Finally, brands remain very important in e-commerce—consumers trust some firms more than others to deliver a high-quality product on time (Slatalla, 2005).

The Bertrand model of extreme market efficiency has not entirely come to pass. Information asymmetries are continually being introduced by merchants and marketers. Search costs may have fallen overall, but the overall transaction cost of actually completing a transaction in e-commerce remains high because users have a bewildering number of new questions to consider: Will the merchant actually deliver? What is the time frame of delivery? Does the merchant really have stock on this item? How do I fill out this form? Nearly 60% of potential e-commerce purchases are terminated in the shopping cart stage because of these consumer uncertainties. In many product areas, it is easier to call a trusted catalog merchant on the telephone than order on a Web site. Finally, intermediaries have not disappeared as predicted, and few manufacturers or producers have actually developed a one-to-one sales relationship with their ultimate consumers. Most manufacturers, for instance, have not adopted the Dell model of online sales.

FIGURE 1.9 SHARE OF RETAIL ONLINE SALES BY TYPE OF COMPANY



Web-only firms account for less than one-third of online retail firm revenues.
SOURCE: Internet Retailer, 2005.

If anything, e-commerce has created many new opportunities for middlemen to aggregate content, products, and services into portals and search engines and thereby introduce themselves as the "new" intermediaries. Yahoo, MSN, Google, and Amazon, along with third-party travel sites such as Expedia, are all examples of this kind of new intermediary. As illustrated in **Figure 1.9**, e-commerce did not drive existing retail chains and catalog merchants out of business although it has created opportunities for new entrepreneurial Web-only firms to succeed. In fact, existing retail chains with physical stores as well as Web sites earned the largest portion of online sales in 2005.

The visions of many entrepreneurs and venture capitalists for e-commerce have not materialized exactly as predicted. First-mover advantage appears to have succeeded only for a very small group of sites. Historically, first movers have been long-term losers, with the early-to-market innovators usually being displaced by established "fast follower" firms with the financial, marketing, legal, and production complimentary assets needed to develop mature markets, and this has proved true for e-commerce as well. A number of e-commerce first movers, such as eToys.com, FogDog.com (sporting goods), WebVan.com (groceries) and Eve.com (beauty products) are out of business. Customer acquisition and retention costs during the early years of e-commerce were extraordinarily high, with some firms, such as E*Trade and other financial service firms paying up to $400 to acquire a new customer. In 2004, certain law firms engaged in asbestos and tobacco liability suits were paying $90 each time someone clicked on their Google ad (Bialik, 2004). The overall costs of doing business on the Web—including the costs of technology, site design and maintenance, and warehouses for fulfillment—are no lower than the costs faced by the most efficient bricks-and-mortar stores. A large warehouse costs tens of millions of dollars regardless of a firm's Web presence. The knowledge of how to run the warehouse is priceless, and not easily moved. The start-up costs can be staggering, as Amazon discovered. Attempting to achieve profitability by

TABLE 1.5 EARLY YEARS OF E-COMMERCE COMPARED TO E-COMMERCE TODAY

EARLY YEARS OF E-COMMERCE	E-COMMERCE TODAY
Technology-driven	Business-driven
Revenue growth emphasis	Earnings and profits emphasis
Venture capital financing	Traditional financing
Ungoverned	Stronger regulation and governance
Entrepreneurial	Large traditional firms
Disintermediation	Strengthening intermediaries
Perfect markets	Imperfect markets, brands, and network effects
Pure online strategies	Integrated, multi-channel bricks-and-clicks strategies
First mover advantages	Strategic follower strength; complimentary assets

raising prices has often led to large customer defections. From the e-commerce merchant's perspective, the "e" in e-commerce does not stand for "easy."

Table 1.5 summarizes some of the most important differences between today's e-commerce and the early period.

PREDICTIONS FOR THE FUTURE

The future of e-commerce is now more clear, although not certain. There are five main factors that will help define the future of e-commerce. First, there is little doubt that the technology of e-commerce—the Internet, the Web, and the growing number of wireless Internet devices—continue to propagate through all commercial activity. The overall revenues from e-commerce will continue to rise on a steep growth path, most likely in the range of 20%-25% per year through 2010. The number of products and services sold on the Web and the size of the average purchase order are both growing at double digit rates. The number of online shoppers will eventually stop increasing at double digit rates as the Internet saturates American households.

Home products, computer hardware/software, and apparel are the top-selling online items (see **Table 1.6**). Retail travel services (airline tickets, car rental, and hotel reservations) and financial services (described in Chapter 11) are the top service categories. There has also been a significant broadening of the online product mix compared to the early years when books, computer software, and hardware dominated e-commerce. The fastest growing major non-travel e-commerce categories include home products, flowers/cards and gifts, sporting goods and equipment, jewelry/luxury goods, and apparel (see Chapters 10 and 11 for changes in retail products and services).

Second, e-commerce prices will rise to cover the real costs of doing business on the Web, and to pay investors a reasonable rate of return on their capital. Third, e-commerce margins (the difference between the revenues from sales and the cost

TABLE 1.6 ONLINE RETAIL SALES BY CATEGORY, 2004–2010

CATEGORY	ANNUAL SALES (IN BILLIONS)			COMPOUND ANNUAL GROWTH RATE (CAGR)
	2004	2007	2010	2004–2010
Home products	$15.4	$30.4	$43.30	19%
Computer hardware/software	$12.0	$15.4	$17.4	6%
Apparel	$11.7	$19.5	$28.4	16%
Consumer electronics	$7.5	$12.3	$13.7	11%
Tickets	$4.3	$7.1	$9.7	15%
Flower/cards/gifts	$3.8	$7.5	$10.1	18%
Music/video goods	$3.7	$6.0	$8.4	15%
Books	$3.7	$5.4	$6.4	10%
Toys/video games	$3.4	$5.0	$6.3	11%
Sporting goods/equipment	$3.2	$6.1	$8.4	17%
Jewelry/luxury goods	$2.8	$5.3	$7.0	16%
Health/beauty	$2.4	$4.2	$5.0	13%
Other	$5.3	$7.1	$9.4	10%
Total	**$79.2**	**$131.1**	**$173.5**	**14%**

SOURCE: eMarketer, Inc., 2005b

of goods) and profits will rise to levels more typical of all retailers. Fourth, the cast of players will change radically. In the B2C and B2B marketspaces, traditional well-endowed, experienced Fortune 500 companies will play a growing and dominant role in e-commerce. There will also be a continuation of audience consolidation on the Internet in general, with the top few sites garnering over 90% of the audience share. **Table 1.7** lists the top 25 online retailers, as ranked by 2004 online sales. The table shows an unmistakable trend toward the appearance in the top 25 sites of some very well-known, traditional brands from strong traditional businesses, with Office Depot, Staples, Hewlett Packard, Sears, Sony, Best Buy, J.C.Penney, Walmart, and Target all in the top 15.

Fifth, the number of successful pure online companies will remain smaller than integrated online/offline stores that combine traditional sales channels such as physical stores and printed catalogs with online efforts. Amazon.com will increasingly use printed catalogs; Proctor & Gamble will continue to develop informative Web sites such as Tide.com; and the major automotive companies will continue to improve the content and value of their Web sites even if they do not enter into direct sales relationships with consumers, but instead use the Web to assist sales through dealers (thereby strengthening traditional intermediaries and channels).

TABLE 1.7 TOP 25 ONLINE RETAILERS RANKED BY ONLINE SALES

ONLINE RETAILER	ONLINE SALES (2004)
Amazon.com	$6.921 billion
Dell.com	$3.257 billion
OfficeDepot.com	$3.100 billion
Staples.com	$3.00 billion
HPShopping.com (HPDirect)	$2.691 billion
Sears.com	$1.740 billion
SonyStyle.com	$1.597 billion
CDW.com	$1.525 billion
Newegg.com	$1.000 billion
BestBuy.com	$958 million
JCPenney.com	$812 million
Walmart.com	$782 million
Target.com	$756 million
Quixtar.com	$748 million
QVC.com	$739 million
CircuitCity.com	$577 million
Apple.com	$547 million
Netflix.com	$506 million
Overstock.com	$495 million
Williams-sonoma.com	$477 million
Avon.com	$456 million
Gap.com	$439 million
BN.com	$419 million
Gateway.com	$ 418 million
Redcatsusa.com	$ 401 million

SOURCE: Based on data from Internet Retailer, 2005; Company Reports on Form 10-K filed with the Securities and Exchange Commission.

The future of e-commerce will include the growth of regulatory activity both in the United States and worldwide. Governments around the world are challenging the early vision of computer scientists and information technologists that the Internet remain a self-regulating and self-governing phenomenon. The Internet and e-commerce have been so successful and powerful, so all-pervasive, that they directly involve the social, cultural, and political life of entire nations and cultures. Throughout history, whenever technologies have risen to this level of social importance, power, and visibility, they become the target of efforts to

regulate and control the technology to ensure that positive social benefits result from their use and to guarantee the public's health and welfare. Radio, television, automobiles, electricity, and railroads are all the subject of regulation and legislation. Likewise, with e-commerce. In the U.S. Congress, there have already been more than 100 pieces of legislation proposed to control various facets of the Internet and e-commerce, from consumer privacy to pornography, child abuse, gambling, and encryption. We can expect these efforts at regulation in the United States and around the world to increase as e-commerce extends its reach and importance.

In summary, the future of e-commerce will become primarily business-driven, with a view to producing solid returns and profits, dominated by large traditional business firms and increasingly subject to national and global regulations.

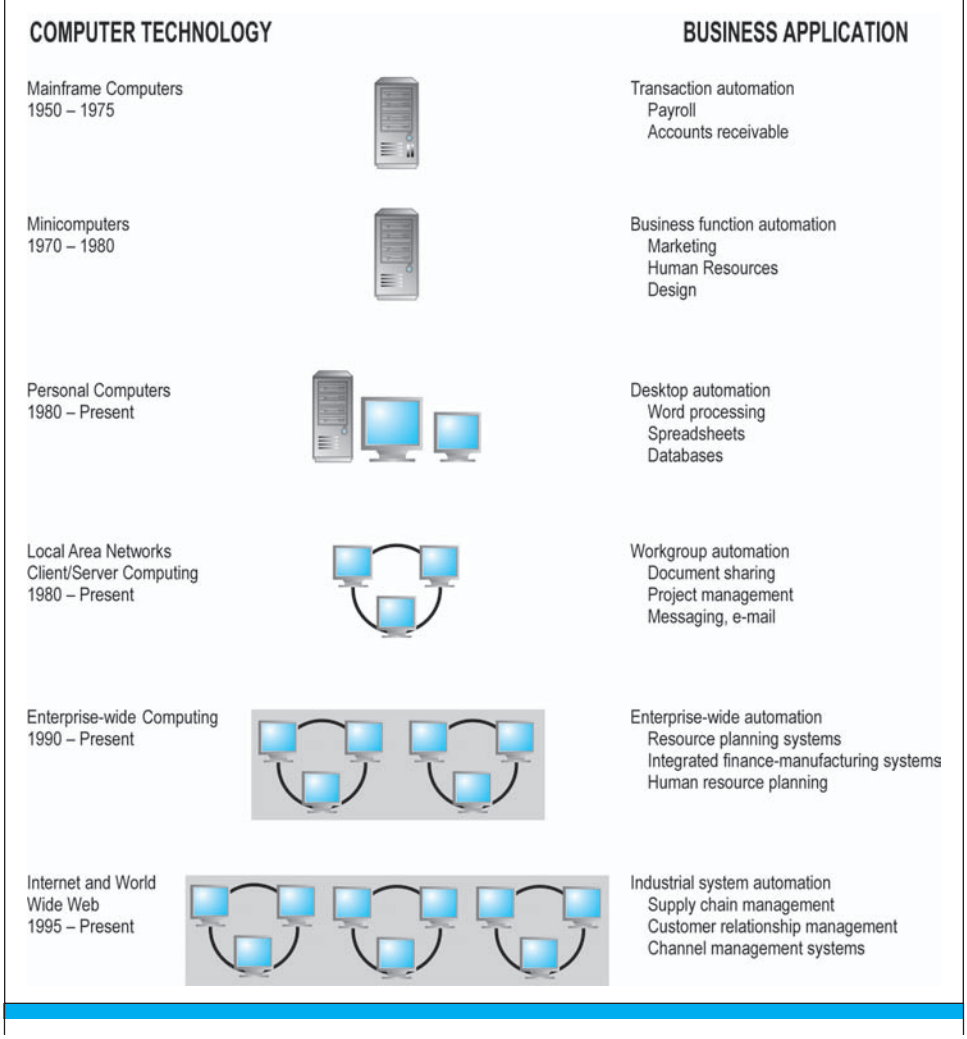
1.3 UNDERSTANDING E-COMMERCE: ORGANIZING THEMES

Understanding e-commerce in its totality is a difficult task for students and instructors because there are so many facets to the phenomenon. No single academic discipline is prepared to encompass all of e-commerce. After teaching the e-commerce course for several years and preparing this book, we have come to realize just how difficult it is to "understand" e-commerce. We have found it useful to think about e-commerce as involving three broad interrelated themes: technology, business, and society. We do not mean to imply any ordering of importance here because this book and our thinking freely range over these themes as appropriate to the problem we are trying to understand and describe. Nevertheless, as in previous technologically driven commercial revolutions, there is an historic progression. Technologies develop first, and then those developments are exploited commercially. Once commercial exploitation of the technology becomes widespread, a host of social, cultural, and political issues arise.

TECHNOLOGY: INFRASTRUCTURE

The development and mastery of digital computing and communications technology is at the heart of the newly emerging global digital economy we call e-commerce. To understand the likely future of e-commerce, you need a basic understanding of the information technologies upon which it is built. E-commerce is above all else a technologically driven phenomenon that relies on a host of information technologies as well as fundamental concepts from computer science developed over a 50-year period. At the core of e-commerce are the Internet and the World Wide Web, which we describe in detail in Chapter 3. Underlying these technologies are a host of complementary technologies—personal computers, local area networks, relational databases, client/server computing, and fiber optic switches, to name just a few. These technologies lie at the heart of sophisticated business computing applications such as enterprise-wide computing systems, supply chain management systems, manufacturing resource planning systems, and customer relationship management systems. E-commerce relies on all these basic technologies—not just the Internet. The Internet—while representing a sharp break from prior corporate computing and communications technologies—is nevertheless just the latest development in the

FIGURE 1.10 **THE INTERNET AND THE EVOLUTION OF CORPORATE COMPUTING**



The Internet and World Wide Web are the latest in a chain of evolving technologies and related business applications, each of which builds on its predecessors.

evolution of corporate computing and part of the continuing chain of computer-based innovations in business.

Figure 1.10 illustrates the major stages in the development of corporate computing and indicates how the Internet and the Web fit into this development trajectory.

To truly understand e-commerce, then, you will need to know something about client/server computing, packet-switched communications, protocols such as TCP/IP, Web servers, and HTML. All of these topics are described fully in Part 2 of the book (Chapters 3–6).

BUSINESS: BASIC CONCEPTS

While the technology provides the infrastructure, it is the business applications—the potential for extraordinary returns on investment—that create the interest and excitement in e-commerce. New technologies present businesses and entrepreneurs with new ways of organizing production and transacting business. New technologies change the strategies and plans of existing firms: old strategies are made obsolete and new ones need to be invented. New technologies are the birthing grounds where thousands of new companies spring up with new products and services. To truly understand e-commerce, you will need to be familiar with some key business concepts, such as the nature of digital electronic markets, digital goods, business models, firm and industry value chains, value webs, industry structure, and consumer behavior in digital markets. We'll examine each of these concepts further in Chapter 2 and throughout the book.

SOCIETY: TAMING THE JUGGERNAUT

With around 175 million adult Americans now using the Internet, many for e-commerce purposes, and around 1 billion users worldwide, the impact of the Internet and e-commerce are significant and global. Increasingly, e-commerce is subject to the laws of nations and global entities. You will need to understand the pressures that global e-commerce places on contemporary society in order to conduct a successful e-commerce business or understand the e-commerce phenomenon. The primary societal issues we discuss in this book are intellectual property, individual privacy, and public welfare policy. Because the cost of distributing digital copies of copyrighted intellectual property—tangible works of the mind such as music, books, and videos—is nearly zero on the Internet, e-commerce poses special challenges to the various methods societies have used in the past to protect intellectual property rights.

Since the Internet and the Web are exceptionally adept at tracking the identity and behavior of individuals online, e-commerce raises difficulties for preserving privacy—the ability of individuals to place limits on the type and amount of information collected about them, and to control the uses of their personal information. Read *Insight on Society: Keeping Your Clickstream Private Is Getting Harder* to get a view of some of the ways e-commerce sites use personal information.

The global nature of e-commerce also poses public policy issues of equity, equal access, content regulation, and taxation. For instance, in the United States, public telephone utilities are required under public utility and public accommodation laws to make basic service available at affordable rates so everyone can have telephone service. Should these laws be extended to the Internet and the Web? If goods are purchased by a New York state resident from a Web site in California, shipped from a center in Illinois, and delivered to New York, what state has the right to collect a sales tax? If some societies choose to ban selected images, selected commercial activity (such as gambling), or political messages from their public media, then how can that society exercise content and activity control over a global e-commerce site? What rights do nation-states and their citizens have with respect to the Internet, the Web, and e-commerce?

INSIGHT ON SOCIETY

KEEPING YOUR CLICKSTREAM PRIVATE IS GETTING HARDER

Do you ever have the feeling that you no longer control your computer screen, or your e-mail inbox? Today, upwards of 75% of all e-mail is unsolicited junk mail called spam. In a year, thousands of ads will appear on your screen that you never asked for and are often irrelevant to you. Yet one of the virtues, or vices (depending on your perspective), of e-commerce technology is that it permits online merchants to send you advertising that supposedly reflects personal information the merchant has gathered about you. This is called "one-to-one" marketing or "personalization." This personal information might include what products you have previously purchased from the merchant, what kind of content you have viewed at its site, how you arrived at the site (where you were previously), as well as all of your clicking behavior at the site. This clickstream becomes the basis for constructing a digital profile of you. Your clicksteam and resulting profile is a marketer's and merchant's goldmine: if you know what people like and what they have recently purchased, you stand a good chance of being able to sell them something else. How does a Web-based company find out about your clickstream?

One way is through advertising networks such as DoubleClick, ValueClick Media, and 24/7 Real Media. These advertising networks insert themselves between you and the merchant. When you visit any of thousands of Web sites in the network, the network firms log your access to the site, and then follow your movements through the site (as does the merchant). Your clickstream behavior is merged with that of thousands of other consumers, and then these firms pop banner ads on your browser when visiting the network member sites. For instance, ValueClick Media is one of the largest online advertising networks, representing more than 6,000 online sites of all sizes, including top portals, leading vertical content sites, and niche content sites. Chances are very good that every day you go on the Web your clickstream behavior will be picked up by ValueClick Media. ValueClick Media uses this information to deliver pop-up ads to your screen and send other marketing messages to you. In general, the advertising networks do not know who you are personally—they do not know your name, address, or other personally identifiable information. What they do know is the in-network Web sites that you visited and what pages you viewed, what boxes or items you clicked, and any other information generated in the browser-client interaction with the exception of secured or encrypted information entered onto secured pages (such as a shopping cart). At this point, you are just another Internet customer with a cookie.

Merchant sites also keep a complete contact log of every click you make and every object you choose to see on their Web sites. This is a built-in capability of Web server software. This data is stored and can be mined to create a profile of your behavior on the site. All Web sites use cookies and many use Web bugs. A cookie is a small text file downloaded onto your hard drive by a Web site. The cookie file contains whatever identifying information the merchant chooses to put in it. They can be read by other Web sites you visit and used to track your movement among sites. A Web bug is a tiny graphic, typically one pixel wide and one pixel deep, embedded within a Web page or e-mail. It usually is transparent or blends into the background color. A Web bug in a

(continued)

Web page can report information such as a visitor's IP address, cookie information, and referring URL back to the sending server or to the server of a third party, such as a Web advertising company. Hidden inside e-mail messages, a Web bug can tell the merchant whether you opened the e-mail, and even more alarming to privacy advocates, can match the e-mail address with a previously set cookie, thereby allowing the merchant to coordinate a specific individual with their actions on the Web. The merchant then has a great deal of both clickstream behavior and personal information about you generated at the merchant's site, including all the information entered into shopping carts and payment information. So when you return to Amazon, Amazon knows your purchase history and can recommend new titles.

Now let's go over the top: the latest Internet privacy pest is spyware, also known as adware. People often make a distinction between adware and spyware: adware is designed to serve you ads, and spyware is designed to record information from your computer (such as your credit card number or any other personal information) and send it to a remote server. Both operate on the same principle: these are small software programs that secretly install themselves on your computer by piggybacking on larger applications, or by downloading potentially any file from the Web. The most common source of adware and spyware are file-sharing programs such as Kazaa and online contests where you need to download a program in order to participate. Once installed, adware calls out to other sites to send banner ads and other obnoxious unsolicited material to your screen. Spyware also can report your movements on the Internet to other computers. If, for instance, you ask your browser to go to www.llbean.com, adware can divert you to a competitor, or pop a banner ad on your screen offering a 10% discount if you visit the competitor's site. Spyware really lives up to its name when it is used to transmit user keystrokes to remote servers. In this application, anything you enter on your keyboard—including passwords, personal names, your address or financial information—can all be sent to remote servers without you knowing about it.

Many people feel that efforts to market products and services to you based on your online behavior is an invasion of their privacy. They believe that while it may increase sales in the short term, violating personal privacy on the Web is bad business. For instance, in its annual Digital Future Report, the USC Annenberg School found 88% of Internet users reported some level of concern about the lack of online privacy, and 45% were "very or extremely concerned" about privacy while shopping online. The percentage of "very or extremely concerned" is down from previous years, but the average level is the same. eMarketer and Forrester Research report that 52% of Internet users think Web sites ask for too much information when registering, 45% believe their privacy has eroded since going online, and 56% oppose Web sites collecting non-personally identifiable information even if it results in more relevant advertising. On the other hand, millions of online consumers willingly give up their private information in return for a benefit such as premium information content (reports and white papers), or simply the chance to win a contest.

Can you protect your privacy in the Internet age (and still use the Web for convenient shopping)? There are several kinds of solutions: merchant privacy policy, advertising network privacy policy, technology, and enforcement of existing and new laws. Some new technologies that can help are called anonymizers. Companies such as Zero-Knowledge Systems and Anonymizer.com have developed software packages and their own Web servers that you can use to hide your identity online. Software programs such as SpySweeper and Ad-aware can help remove spyware programs. In May 2005, New York State Attor-

ney General Elliot Spitzer filed a lawsuit against Intermix Media for illegal distribution of adware to more than 3.7 million New York residents without proper notification or consent. The companies were charged with deceptive business practices and false advertising, traditional laws on the books for many years. As a result of the growing unpopularity of adware and lawsuits, a leading distributor, Claria Corporation (formerly Gator Corporation), has changed its business model to one of selling online ad space on sites that agree to use its software, and making it easier for people to reject loading the software in the first place, and easier to remove the program.

As we describe in later chapters (especially Chapter 9), efforts to regulate online privacy and create new laws to protect online commercial privacy have not been widely successful, although self-regulation by advertising networks has produced some progress.

Most Web merchants are learning that it pays to be sensitive to customers' concerns about privacy. Trust is critical to successful e-commerce. Almost all sites have "opt-out" check boxes that allow visitors the option to not receive e-mail and other marketing information from the site. Many sites have "opt-in" policies that require customers to check a box if they want to receive additional marketing messages. All of the Web's top 25 e-merchants, as well as many others, have privacy policies posted on their sites. The question remains: Do these Web site privacy policies achieve what consumers want?

SOURCES: "Take My Privacy, Please!" by Ted Koppel, *New York Times*, June 15, 2005; "Lawsuit May Roil Online-Ad World," by Riva Richmond, *Wall Street Journal*, May 11, 2005; "Claria Seeks to Burnish Image, Move Beyond Pesky Pop-Ups," by David Kesmodel, *Wall Street Journal*, May 6, 2005; "The Digital Future Report: Surveying the Digital Future," by USC Annenberg School Center for the Digital Future, September 2004; "A Trail of Cookies? Cover Your Tracks," by Thomas J. Fitzgerald, *New York Times*, March 27, 2003; "Eluding a New Web Hazard," by Alex Frangos, *Wall Street Journal*, March 4, 2003; "Send Spyware Into the Cold," by Alex Frangos, *Wall Street Journal*, March 2, 2003. See also Privacyexchange.org and Epic.org for recent surveys on consumer privacy fears.

ACADEMIC DISCIPLINES CONCERNED WITH E-COMMERCE

The phenomenon of e-commerce is so broad that a multidisciplinary perspective is required (see **Figure 1.11**). There are two primary approaches to e-commerce: technical and behavioral.

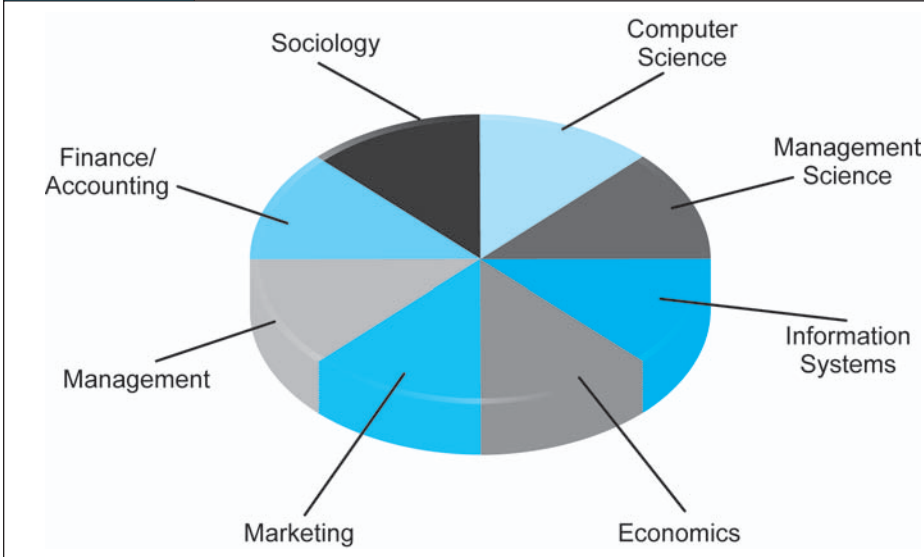
Technical Approaches

Computer scientists are interested in e-commerce as an exemplary application of Internet technology. They are concerned with the development of computer hardware, software, and telecommunications systems, as well as standards, encryption, and database design and operation. Management scientists are primarily interested in building mathematical models of business processes and optimizing these processes. They are interested in e-commerce as an opportunity to study how business firms can exploit the Internet to achieve more efficient business operations.

Behavioral Approaches

In the behavioral area, information systems researchers are primarily interested in e-commerce because of its implications for firm and industry value chains, industry structure, and corporate strategy. The information systems discipline spans the

FIGURE 1.11 DISCIPLINES CONCERNED WITH E-COMMERCE



Many disciplines are directly involved in the study and understanding of e-commerce.

technical and behavioral approaches. For instance, technical groups within the information systems specialty also focus on data mining, search engine design, and artificial intelligence. Economists have focused on consumer behavior at Web sites, pricing of digital goods, and on the unique features of digital electronic markets. The marketing profession is interested in marketing, brand development and extension, consumer behavior on Web sites, and the ability of Internet technologies to segment and target consumer groups, and differentiate products. Economists share an interest with marketing scholars who have focused on e-commerce consumer response to marketing and advertising campaigns, and the ability of firms to brand, segment markets, target audiences, and position products to achieve above-normal returns on investment.

Management scholars have focused on entrepreneurial behavior and the challenges faced by young firms who are required to develop organizational structures in short time spans. Finance and accounting scholars have focused on e-commerce firm valuation and accounting practices. Sociologists—and to a lesser extent psychologists—have focused on general population studies of Internet usage, the role of social inequality in skewing Internet benefits, and the use of the Web as a personal and group communications tool. Legal scholars have become interested in issues such as preserving intellectual property, privacy, and content regulation.

No one perspective dominates research about e-commerce. The challenge is to learn enough about a variety of academic disciplines so that you can grasp the significance of e-commerce in its entirety.

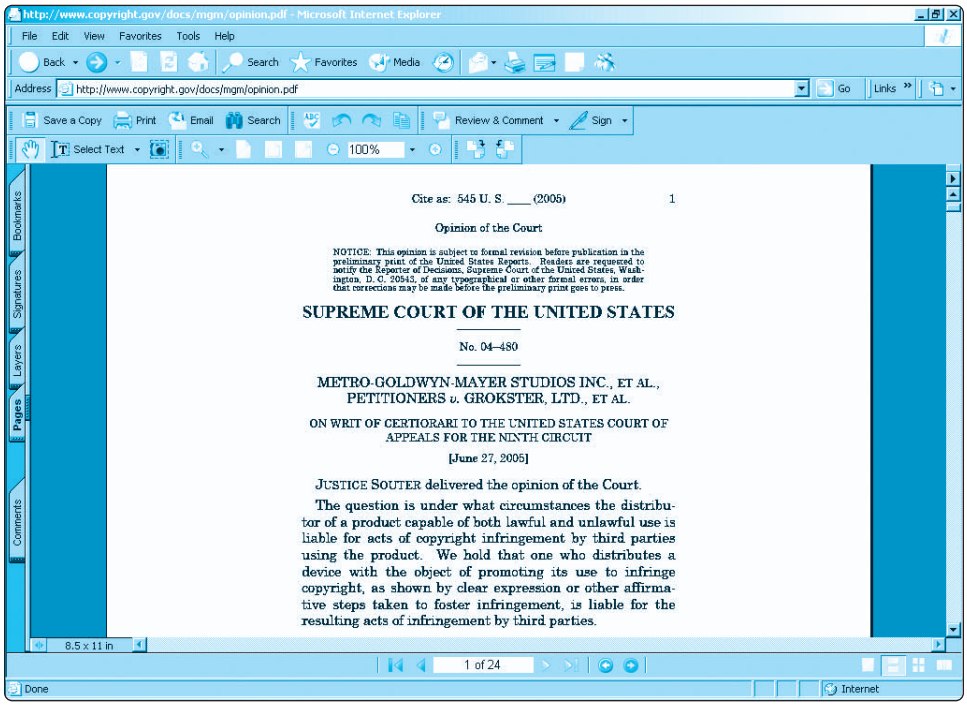
1.4 CASE STUDY

P2P Networks Continue to Rock,

But For How Long?

In 2005, after several years of heated court battles, the case of *Metro Goldwyn Mayer Studios v. Grokster, et al.* finally reached the U.S. Supreme Court. In June 2005, the Court handed down its unanimous decision: Internet file-sharing services such as Grokster, StreamCast, and Kazaa can be held liable for copyright infringement.

In 2005, an estimated 36 million Americans downloaded music files off the Web, about 6 million of them by using P2P services such as Grokster, StreamCast, Kazaa, BitTorrent, eDonkey, and others. Music industry legal filings claim that as much as 90% of the songs downloaded from the file-sharing networks were done so illegally.



Grokster and the other P2P networks followed in the footsteps of Napster—the previous world champion of free music downloads. Founded in 1999, Napster had over 80 million users worldwide by 2001, but it was put out of business by a U.S. federal court decision in 2001 that required Napster to shut down its central servers, which indexed music titles stored on users' computers, while it arranged to either license the music titles from their owners or remove them from its central servers. In July 2002—despite initial efforts to turn Napster into a legal, commercially viable, fee-based music service—Napster declared bankruptcy and closed its doors. The Napster name and logo and remaining assets were acquired out of bankruptcy by Roxio, Inc., which later renamed itself Napster and launched a legal online music subscription service, which has not yet equaled the popularity of the former Napster. Does a similar fate now await Napster's followers?

The first Napster used an earlier P2P network technology that relied on a central index of members' available music. Kazaa uses a different P2P technology that does not require a central index of titles. Kazaa relies on a software program called Fast Track, which was invented in 1997 by two engineers: Niklas Zennstrom (Swedish) and Janus Friis (Dutch). Here's how it works. Users download the Fast Track software free from any of several sources on the Internet. The software helps users create a local shared directory where they can store music tracks they are willing to share and download tracks from others on the network. When users want to search the Web for new tracks, they launch Fast Track and the software searches first for Fast Track "super nodes" on the Internet—high-speed servers volunteered by other users—that contain pointers to other users who have the desired music tracks. From there, the requesting and sharing computers use their local client Fast Track software to establish a direct peer-to-peer link, and the file swap occurs. The super nodes speed up file transfer by identifying several sources of the same music track and establishing multiple download links. The software automatically identifies which computers on the network are capable of acting as super nodes without direction from outside.

Kazaa and other similar file-swapping services claim there is no central index, control, administration, or editing function performed by the company's servers. Critics claim otherwise. For instance, users of Morpheus—a U.S.-based service that relied on Fast Track—were kicked off the Kazaa network last year, indicating central controls do exist. Morpheus went out of business shortly thereafter. Moreover, software experts claim that when Kazaa software cannot find a super node, it "calls home" to a server under Kazaa's control.

Downloading Fast Track brings with it many other programs and occasional viruses. In order to make money, Kaaza loads Fast Track with so-called "spyware" and "adware" programs (discussed in the Insight on Society story in this chapter, and in later chapters), which in turn go out on the Internet and request pop-up advertisements and unsolicited e-mail from vendors who pay for this service. In that sense, Fast Track is an "advertising network" that makes its money not from selling music but from selling to advertisers access to its 65 million users. The music available on Kazaa functions as a draw to a huge Internet audience. Most other file-sharing services operate under the same principles, with few variations on the

central theme of using copyrighted music to create an audience that downloads software, which in turn displays ads on users' computers.

File-swapping services pay no copyright fees to the owners of the copyrighted materials. Instead, they claim that they are not responsible for the way millions of people use their software. If copyright owners are damaged, they argue, the copyright owners should sue the individual violators who are abusing the Kazaa software and not the owners of the software. Any restrictions on the distribution of the software, would, in the eyes of supporters, inhibit the development of a socially desirable new technology. Moreover, Kazaa and Grokster argue that the P2P software has many legitimate uses besides sharing copyrighted music.

These services pose a direct threat to the intellectual property laws of the United States, Europe, and Japan, which require users to obtain permission (and usually pay a fee) for the use of copyrighted materials. The existing publishing, music, and book industries of the world are founded on a legal structure to protect intellectual property. For the copyright-holding industries in the United States—music label companies, Hollywood film producers, and television production firms—file-swapping services are a direct threat to their financial futures.

In October 2001, the world's largest media conglomerates filed a suit in federal court (*Metro Goldwyn Mayer Studios v. Grokster, et al.*), alleging copyright infringement against firms who were using Fast Track software or functionally similar software to swap copyrighted files of any sort. Morpheus, Kazaa, and several other P2P services were named in the suit. A trial began in October 2002. On April 25, 2003, the plaintiffs experienced a severe setback when the United States District Court ruled that Grokster and the other defendants, including Kazaa, could not be held liable for copyright infringement on the grounds that the defendants could not control how people used the software. The judge reasoned that the movie and record companies would have to pursue individual infringers. The District Court relied heavily on the Supreme Court's 1984 Sony decision (*Sony Corp. of America v. Universal Studios, Inc.* 464 U.S. 417) in which the court ruled that Sony could not be held liable for users who copied movies and shared them with others because Sony could not control or have knowledge about consumers illegally copying movies and sharing them, and because videotape technology had substantial non-infringing uses. In August 2004, the 9th U.S. Circuit Court of Appeals in Los Angeles affirmed the District Court's decision.

The music firms appealed this decision to the Supreme Court, which in June 2005 overturned the Circuit Court of Appeals and ruled that Grokster and other P2P networks could be held accountable for the illegal actions of their users if it could be shown that they intended their software to be used for illegal downloading and sharing, and had marketed the software for that purpose. In reaching this decision, the Court said that "one who distributes a device with the object of promoting its use to infringe copyright, as shown by clear expression or other affirmative steps taken to foster infringement, going beyond mere distribution with knowledge of third-party action, is liable for the resulting acts of infringement by third parties using the device, regardless of the device's lawful uses." The court felt that such actions could be distinguished from the facts in the Sony case, because Sony did not intend, encourage, or profit from illegal uses of its videotaping technology. The Court therefore ordered

the case returned to the district court for a trial on the issue of whether Grokster and StreamCast in fact encouraged illegal use of their technology by its users.

The result of this decision is potentially a crippling blow to P2P illegal networks, not because the networks will fail, but because the advertising revenues that provide their revenue stream will dry up as no legitimate business firms will want to be using a patently illegal media to advertise their wares. If they do so, they may open themselves up to lawsuits. Kazaa, for instance, is already trying to recast its behavior in light of the decision, announcing in a press release on June 28, 2005 that "we welcome the remand back to the District Court, as we are confident the legal process will affirm that we have never sought to induce users of our file-sharing software, Kazaa Media Desktop, to illegally violate copyright law, and that we have taken numerous steps to discourage copyright infringement by our users." However, most commentators believe that if the cases go to trial, the record industry is likely to prevail.

In the meantime, the record industry itself has begun a remarkable game of catch-up by offering reasonably priced, legal, high quality downloading services, either on a per-song basis or a subscription basis. In the first six months of 2005, music downloads from legal sites tripled to 159 million songs. Recent surveys confirm a move away from illegal sites and towards Apple's iTunes and other competitors such as the reborn Napster, RealNetwork's RealOne Music Store and Rhapsody service, Yahoo's Yahoo! Music Unlimited, MusicNet, and eMusic, as customers begin to appreciate the higher quality, trustworthy music tracks available. The music industry hopes that this trend means that illegal downloading will soon become a fad of the past.

SOURCES: "Music Downloads Triple at Pay Sites," Yahoo! News, July 8, 2005; "Supreme Court Decision on Grokster v. MGM," Sharman Networks Media Release, June 28, 2005; "Hollywood Wins Internet Piracy Battle," by Krysten Crawford, *CNN/Money*, June 27, 2005; Metro-Goldwyn Mayor Studios Inc. et. al. v. Grokster, Ltd., et. al., U.S. Supreme Court, June 27, 2005; "Music and Video Downloading Moves Beyond P2P," by Mary Maddeen and Lee Rainie, Pew Internet and American Life Project, March 2005; "Music Industry Confronts New Internet Swap Threats," by Anna Wilde Mathews and Charles Goldsmith, *Wall Street Journal*, February 21, 2003; "A Global Journal Report: Music Industry Faces New Threats on Web," by Anna Wilde Mathews and Charles Goldsmith, *Wall Street Journal*, February 21, 2003; "The Race to Kill Kazaa," by Todd Woody, Wired.com, February 2003.

Case Study Questions

1. How can P2P file-sharing networks make money if they do not sell music?
2. Into which category or categories of e-commerce do P2P file-sharing networks fall?
3. What social issues do P2P file-sharing networks such as Grokster and Kazaa raise? Is the record industry justified in attempting to shut them down? Why or why not?
4. Will the Supreme Court's decision inhibit the development of P2P technology or the Internet itself, as proponents of P2P services have claimed?
5. Will illegal downloading sites disappear altogether over time? Why or why not?

1.5 REVIEW

KEY CONCEPTS

■ **Define e-commerce and describe how it differs from e-business.**

- E-commerce involves digitally enabled commercial transactions between and among organizations and individuals. Digitally enabled transactions include all those mediated by digital technology, meaning, for the most part, transactions that occur over the Internet and the Web. Commercial transactions involve the exchange of value (e.g., money) across organizational or individual boundaries in return for products or services.
- E-business refers primarily to the digital enablement of transactions and processes within a firm, involving information systems under the control of the firm. For the most part, e-business does not involve commercial transactions across organizational boundaries where value is exchanged.

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

There are seven features of e-commerce technology that are unique to this medium. E-commerce technology:

- is *ubiquitous*—it is available just about everywhere, at all times, making it possible to shop from your desktop, at home, at work, or even from your car.
- has global reach, permitting commercial transactions to cross cultural and national boundaries far more conveniently and cost-effectively than is true in traditional commerce.
- operates according to *universal standards* shared by all nations around the world. In contrast, most traditional commerce technologies differ from one nation to the next.
- provides information *richness*, which refers to the complexity and content of a message. It enables an online merchant to deliver marketing messages with text, video, and audio to an audience of millions, in a way not possible with traditional commerce technologies such as radio, television, or magazines.
- is *interactive*—it allows for two-way communication between merchant and consumer and enables the merchant to engage a consumer in ways similar to a face-to-face experience, but on a much more massive, global scale.
- increases *information density* (the total amount and quality of information available to all market participants). The Internet reduces information collection, storage, processing, and communication costs while increasing the currency, accuracy, and timeliness of information.
- permits *personalization* and *customization*. Merchants can target their marketing messages to specific individuals by adjusting the message to a person's name, interests, and past purchases. Because of the increase in information density, a great deal of information about the consumer's past purchases and behavior can be stored and used by online merchants. The result is a level of personalization and customization unthinkable with existing commerce technologies.

■ Describe the major types of e-commerce.

There are five major types of e-commerce:

- B2C involves businesses selling to consumers and is the type of e-commerce that most consumers are likely to encounter. In 2005, consumers spent about $142–$172 billion in B2C transactions.
- B2B e-commerce involves businesses selling to other businesses and is the largest form of e-commerce, with an estimated $1.5 trillion in transactions occurring in 2005.
- C2C is a means for consumers to sell to each other. In C2C e-commerce, the consumer prepares the product for market, places the product for auction or sale, and relies on the market maker to provide catalog, search engine, and transaction clearing capabilities so that products can be easily displayed, discovered, and paid for.
- P2P technology enables Internet users to share files and computer resources directly without having to go through a central Web server. Music and file-sharing services, such as Kazaa and Grokster, are prime examples of this type of e-commerce, because consumers can transfer files directly to other consumers without a central server involved.
- M-commerce involves the use of wireless digital devices to enable transactions on the Web.

■ Understand the visions and forces behind the early years of e-commerce.

The early years of e-commerce were a period of explosive growth, beginning in 1995 with the first widespread use of the Web to advertise products and ending in 2000 with the collapse in stock market valuations for dot.com ventures. Among the visions for e-commerce expressed during the period were the following:

- For computer scientists, e-commerce was part of their vision of a universal communications and computing environment that everyone on earth could access with inexpensive computers.
- For economists, e-commerce raised the realistic prospect of a perfect Bertrand market—where price, cost, and quality information are equally distributed—and friction-free commerce.
- For entrepreneurs and their financial backers, e-commerce represented an extraordinary opportunity to earn far above normal returns on investment. Overall, the early days of e-commerce were driven largely by visions of profiting from new technology, with the emphasis on quickly achieving very high market visibility. The source of financing was venture capital funds. The ideology of the period emphasized the ungoverned "Wild West" character of the Web and the feeling that governments and courts could not possibly limit or regulate the Internet; there was a general belief that traditional corporations were too slow and bureaucratic, too stuck in the old ways of doing business to "get it," that is, to be competitive in e-commerce.

■ Understand the successes and failures of e-commerce in the early years.

The early years of e-commerce were:

- a technological success, with the digital infrastructure created during the period solid enough to sustain significant growth in e-commerce during the next decade.

- a mixed business success, with significant revenue growth and customer usage, but low profit margins.

E-commerce during its early years did not:

- fulfill economists' visions of the perfect Bertrand market and friction-free commerce.
- fulfill the visions of entrepreneurs and venture capitalists for first mover advantages, low customer acquisition and retention costs, and low costs of doing business.

■ Identify several factors that will define the next five years of e-commerce.

Factors that will define e-commerce over the next five years include the following:

- E-commerce technology will continue to propagate through all commercial activity, with overall revenues from e-commerce, the number of products and services sold over the Web, and the amount of Web traffic all rising.
- E-commerce prices will rise to cover the real costs of doing business on the Web.
- E-commerce margins and profits will rise to levels more typical of all retailers.
- Traditional well-endowed and experienced Fortune 500 companies will play a growing and more dominant role.
- The number of successful pure online companies will continue to decline and most successful e-commerce firms will adopt an integrated, multi-channel bricks-and-clicks strategy.
- Regulation of e-commerce and the Web by government will grow both in the United States and worldwide.

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

E-commerce involves three broad interrelated themes:

- *Technology*: To understand e-commerce, you need a basic understanding of the information technologies upon which it is built, including the Internet and the World Wide Web, and a host of complimentary technologies—personal computers, local area networks, client/server computing, packet-switched communications, protocols such as TCP/IP, Web servers, HTML, and relational databases, among others.
- *Business*: While technology provides the infrastructure, it is the business applications—the potential for extraordinary returns on investment—that create the interest and excitement in e-commerce. New technologies present businesses and entrepreneurs with new ways of organizing production and transacting business. Therefore, you also need to understand some key business concepts such as electronic markets, information goods, business models, firm and industry value chains, industry structure, and consumer behavior in electronic markets.
- *Society*: Understanding the pressures that global e-commerce places on contemporary society is critical to being successful in the e-commerce marketplace. The primary societal issues are intellectual property, individual privacy, and public policy.

■ Identify the major academic disciplines contributing to e-commerce research.

There are two primary approaches to e-commerce: technical and behavioral. Each of these approaches is represented by several academic disciplines. On the technical side:

- Computer scientists are interested in e-commerce as an application of Internet technology.
- Management scientists are primarily interested in building mathematical models of business processes and optimizing them to learn how businesses can exploit the Internet to improve their business operations.
- Information systems professionals are interested in e-commerce because of its implications for firm and industry value chains, industry structure, and corporate strategy.
- Economists have focused on consumer behavior at Web sites, and on the features of digital electronic markets.

On the behavioral side:

- Sociologists have focused on studies of Internet usage, the role of social inequality in skewing Internet benefits, and the use of the Web as a personal and group communications tool.
- Finance and accounting scholars have focused on e-commerce firm valuation and accounting practices.
- Management scholars have focused on entrepreneurial behavior and the challenges faced by young firms who are required to develop organizational structures in short time spans.
- Marketing scholars have focused on consumer response to online marketing and advertising campaigns, and the ability of firms to brand, segment markets, target audiences, and position products to achieve higher returns on investment.

QUESTIONS

1. What is e-commerce? How does it differ from e-business? Where does it intersect with e-business?
2. What is information asymmetry?
3. What are some of the unique features of e-commerce technology?
4. What is a marketspace?
5. What are three benefits of universal standards?
6. Compare online and traditional transactions in terms of richness.
7. Name three of the business consequences that can result from growth in information density.
8. Give examples of B2C, B2B, C2C, and P2P Web sites besides those listed in the chapter materials.
9. How are the Internet and the Web similar to or different from other technologies that have changed commerce in the past?
10. What are the major limitations on the growth of e-commerce? Which is potentially the toughest to overcome?
11. What are three of the factors that will contribute to greater Internet penetration in U.S. households?
12. Define disintermediation and explain the benefits to Internet users of such a phenomenon. How does disintermediation impact friction-free commerce?

13. What are some of the major advantages and disadvantages of being a first mover?
14. Discuss the ways in which the early years of e-commerce can be considered both a success and a failure.
15. What are five of the major differences between the early years of e-commerce and today's e-commerce?
17. What factors will help define the future of e-commerce over the next five years?
18. Why is a multidisciplinary approach necessary if one hopes to understand e-commerce?

PROJECTS

1. Search the Web for an example of each of the five major types of e-commerce described in Section 1.1. Create a PowerPoint presentation or written report describing each Web site (take a screenshot of each, if possible), and explain why it fits into one of the five types of e-commerce.

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

3. Given the development and history of e-commerce in the years from 1995–2005, what do you predict we will see during the next five years of e-commerce? Describe some of the technological, business, and societal shifts that may occur as the Internet continues to grow and expand. Prepare a brief PowerPoint presentation or written report to explain your vision of what e-commerce looks like today.

4. Follow up on events at Amazon subsequent to January 2006 (when the opening case was prepared). Has Amazon moved any closer to becoming the Internet's version of Wal-Mart (the world's largest online store)? Is it closer to sustained profitability? What are its current prospects for success or failure? Prepare a short report on your findings.

WEB SITE RESOURCES www.prenhall.com/Laudon

- News: News stories relevant to the material in this chapter
- Research: Important e-commerce research abstracts and links to articles
- Additional projects, exercises, and tutorials
- Careers: Explore career opportunities in e-commerce
- Raising capital and business plans