FIGURE 1.2   An organization's IT components, platform, IT services, and IT infrastructure.

The Google and Amazon cases in this chapter illustrate the vital importance of IT infrastructures and platforms to organizations in today's competitive environment. The platforms of Google and Amazon operate within a global, Web-based platform that has recently emerged (see Figure 1.3). The next section discusses this global platform.

1.2 The Global Web-Based Platform

The global, Web-based platform that has recently emerged spans the world and is best represented by the Internet and the functionality of the World Wide Web. The platform enables individuals to connect, compute, communicate, collaborate, and compete everywhere and anywhere, anytime and all the time; to access limitless amounts of information, services, and entertainment; to exchange knowledge; and to produce and sell goods and services. It operates without regard to geography, time, distance, and even language barriers. In essence, this platform enables globalization. **Globalization** is the integration and interdependence of economic, social, cultural, and ecological facets of life, enabled by rapid advances in information technology.

The Three Stages of Globalization

In his book *The World Is Flat*, Pulitzer Prize-winning author Thomas Friedman argues that the world is flat in the sense that the global competitive playing field is being leveled. Friedman identifies three eras of globalization. The first era, Globalization 1.0, lasted from 1492 to
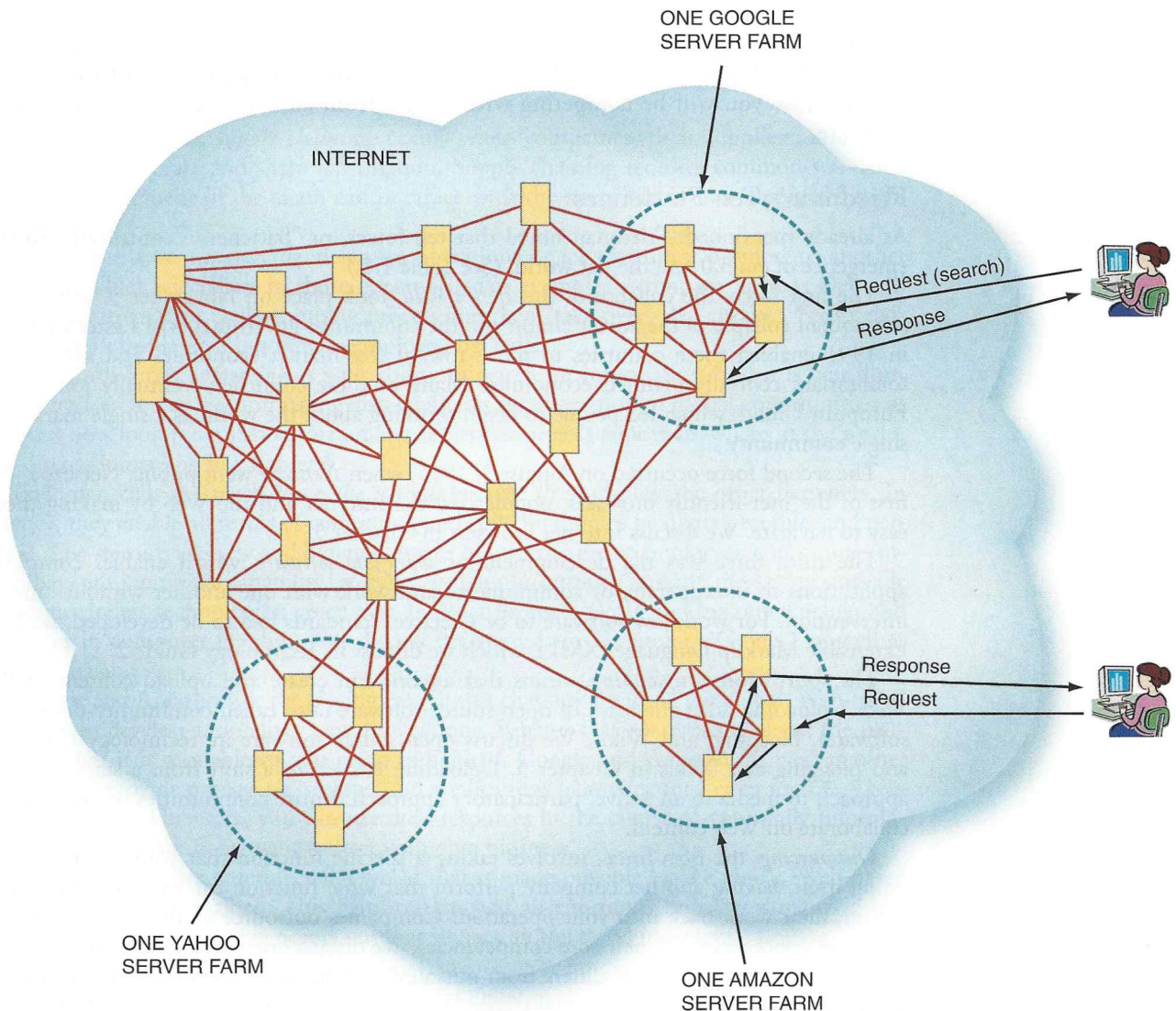
FIGURE 1.3 Organizational server farms in relation to the Internet.

1800. During this period, the force behind globalization was the amount of muscle, horse-power, wind power, or steam power a country had and could deploy.

The second era, Globalization 2.0, lasted from 1800 to 2000. In this era, the force behind globalization was multinational companies—that is, companies that had their headquarters in one country but operated in several countries. In the first half of this period, globalization was driven by falling transportation costs, generated by the development of the steam engine and the railroads. In the second half, globalization was driven by falling telecommunications costs resulting from the telegraph, telephone, computer, satellites, fiber-optic cable, and the Internet and World Wide Web. The global economy began appearing during this era.

Around the year 2000, we entered Globalization 3.0, which was driven by the convergence of ten forces that Friedman calls "flatteners" (discussed below). In era 3.0, we are witnessing the emergence of a global, Web-based platform.

Each era has been characterized by a distinctive focus: Globalization 1.0 focused on countries, Globalization 2.0 on companies, and Globalization 3.0 on groups and individuals. This observation makes our discussion all the more important for each of you, because you will be competing with people from all over a flat world when you graduate.

Friedman's Ten Flatteners

As already mentioned, Friedman noted that ten forces, or "flatteners," contributed to the emergence of era 3.0 and the flat world. (See Table 1.1.)

The first force, the collapse of the *Berlin Wall,* took place on November 9, 1989. The subsequent collapse of the Soviet Union and the communist governments of Eastern Europe in 1991 enabled these countries to move toward free-market economies and away from totalitarian, centrally planned economies. Many of these countries eventually joined the European Union, which led people to begin thinking about the world as a single market or single community.

The second force occurred on August 9, 1995, when *Netscape* went public. Netscape, the first of the user-friendly browsers, popularized the Internet and the Web by making them easy to navigate. We discuss Internet browsers in Chapter 5.

The third force was the development of *workflow software*, which enables computer applications to interoperate, or communicate and work with one another without human intervention. For workflow software to be effective, standards had to be developed, such as Extensible Markup Language (XML), which we discuss in Technology Guide 2.

The fourth force, *uploading*, means that anyone can create and upload content to the Web. Uploading takes the form of open-source software (also called community-developed software), blogging, and Wikis. We discuss open-source software in Technology Guide 2, and blogging and Wikis in Chapter 5. Uploading has led to a shift from a static, passive approach to media to an active, participatory approach. Entire communities of people now collaborate on Web content.

Outsourcing, the fifth force, involves taking a specific function that your company was doing itself, having another company perform that same function for you, and then integrating their work back into your operation. Companies outsource so that they can lower costs and concentrate on their core competencies. We discuss outsourcing in Chapter 10.

Offshoring, the sixth force, differs from outsourcing. Offshoring occurs when a company moves an entire operation, or certain tasks, to another country. An example of an entire operation would be moving an entire plant. Tasks that are likely to be offshored involve lower-value-added activities such as rendering architectural drawings and medical transcription.

Table 1.1

Friedman's Ten Flatteners

- Fall of the Berlin Wall
- Netscape now a public offering
- Development of workflow software
- Uploading
- Outsourcing
- Offshoring
- Supply chaining
- Insourcing
- Informing
- The steroids (computing, instant messaging and file sharing, wireless technologies, voice over Internet Protocol [VoIP], videoconferencing, and computer graphics)

There, the operation and/or activities are performed the same way, but with cheaper labor, lower taxes, fewer benefits, and so on. Companies also choose to offshore in order to penetrate and then serve a foreign market without having to deal with trade barriers. We discuss offshoring in Chapter 10.

The seventh force, *supply chaining*, occurs when companies, their suppliers, and their customers collaborate and share information. Supply chaining requires common standards so that each segment of the chain can interface with the next. We discuss supply chains in Chapter 8.

The eighth force, *insourcing*, delegates operations or jobs within a business to another company, which specializes in those operations. For example, a company such as Dell will hire FedEx to analyze Dell's shipping process and then "take over" that process. FedEx employees work inside Dell but remain employed by FedEx.

The ninth force, *informing*, is your ability to search for information, and it is best illustrated by search engines. Informing also facilitates the formation of global communities, as you can now look for collaborators on any subject or project almost anywhere in the world. We discuss informing in Chapter 5.

Friedman calls the tenth force *the steroids* because they amplify the other flatteners. In essence, they enable all forms of computing and collaboration to be digital, mobile, and personal. The steroids are new and dynamic forms of information technologies: computing (including computational capability, storage, and input/output); instant messaging and file sharing; wireless technologies; voice over Internet Protocol (VoIP); videoconferencing; and advances in computer graphics. We discuss the steroids in Technology Guide 1 as well as Chapters 5 and 7.

Google and Amazon (see the closing case in this chapter) are using the global, Web-based platform to develop and deliver new applications. What is really interesting about the platform is that it is available to you as an individual. Google and Amazon (as well as other companies) provide processing, storage, and applications to anyone for free or for a very reasonable charge. Therefore, you can use their resources in the course of your daily information processing and if you want to start your own business.

In essence, you are entering a flat world that is made possible by the global, Web-based platform we have described. This platform has had an enormous impact on many industries. The following example points out that impact on the travel industry.

Do It Yourself Traveling Whatever happened to travel agencies? The answer is that the Web-based platform has heavily impacted this industry, and not for the better. Web users are planning almost all of their travel online. In 2006, for example, 80 percent of Americans who arranged trips on the Web also bought their tickets online. Now, a new generation of travel sites is making trip planning cheaper, more efficient, and more fun. Here is a quick look at the top new sites that illustrate what has happened to an entire industry.

Example

Shopping for Flights. Two-thirds of online travel planners use the big three: Expedia (*www.expedia.com*), Travelocity (*www.travelocity.com*), and Priceline (*www.priceline.com*). However, a new way to search for bargain flights is on Kayak (*www.kayak.com*). The site covers fares on some 300 airlines in any given week and saves time by letting you adjust search parameters by using a sliding dial, without having to start from scratch.

Plan Your Itinerary. Yahoo's Trip Planner (*http://travel.yahoo.com/trip*) provides a Web folder for your online research about museums, restaurants, lodging, and sights at your destination.

Organize a Group Trip. TripHub (*www.triphub.com*) allows you to book group tickets, discuss the best hotels and sights to see, or decide where you will all meet upon arrival.

This book will discuss, explain, and illustrate the characteristics of the dynamic global business environment. Further, we will discuss how you and your organization can use the Web-based platform to survive and compete in this environment.

Before You Go On . . .

1. What are the characteristics of the modern business environment?
2. Describe the Web-based, global platform.
3. Describe the global, Web-based platform used by modern organizations.

1.4 Business Pressures, Organizational Responses, and IT Support

Modern organizations must compete in a challenging environment. Companies must react rapidly to problems and opportunities arising from extremely dynamic conditions. In this section we examine some of the major pressures confronting modern organizations, and we discuss how organizations are responding to these pressures.
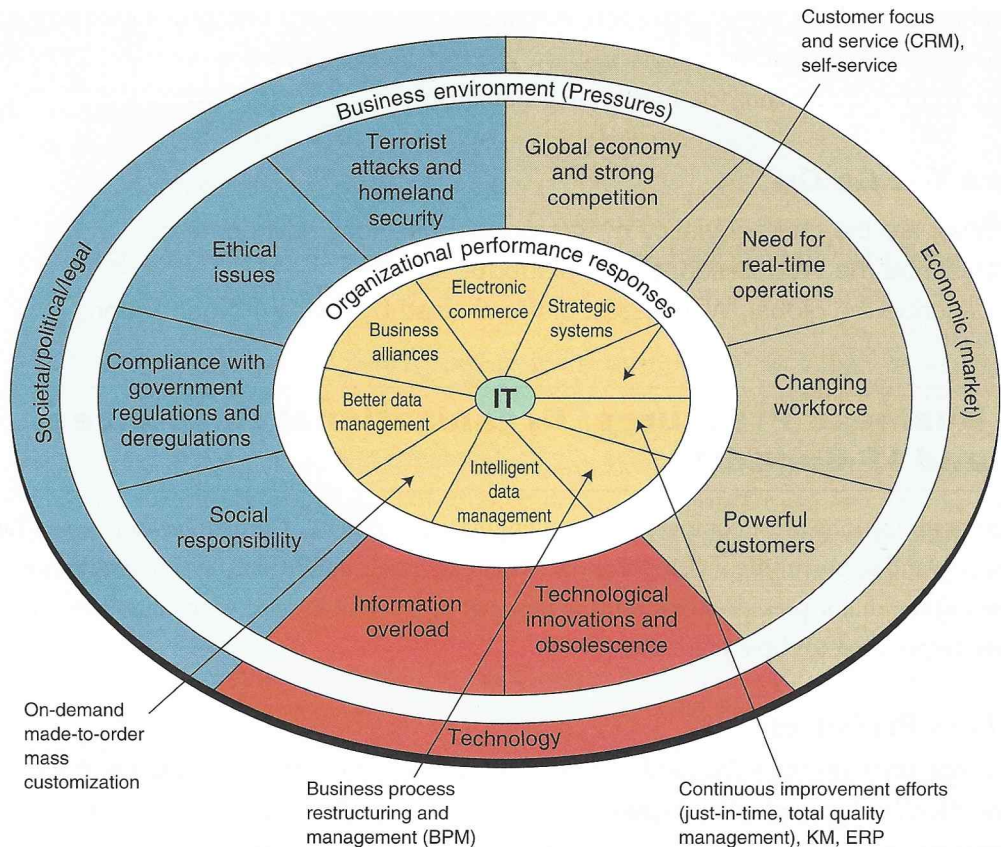
Business Pressures

The *business environment* is the combination of social, legal, economic, physical, and political factors that affect business activities. Significant changes in any of these factors are likely to create business pressures on organizations. Organizations typically respond to these pressures with activities supported by IT. Figure 1.4 shows the relationships among business pressures, organizational performance and responses, and IT support. We focus on three types of business pressures that organizations face: market, technology, and societal pressures.

Market Pressures.   Market pressures are generated by the global economy and strong competition, the changing nature of the workforce, and powerful customers. We'll look at each of these factors in turn.

Global Economy and Strong Competition.   The move to a global economy has been facilitated by the emergence of the global, Web-based platform. Regional agreements such as the North American Free Trade Agreement (NAFTA), which includes the United States, Canada, and Mexico, and the creation of a unified European market with a single currency, the euro, have contributed to increased world trade. Further, the rise of India and China as economic powerhouses has markedly increased global competition.

One important pressure that exists for businesses in a global market is the cost of labor, which varies widely among countries. In general, labor costs are higher in developed countries like the United States and Japan than in developing countries such as China and El Salvador. Also, developed countries usually offer greater benefits, such as health care, to employees, driving the cost of doing business even higher. Therefore, many labor-intensive industries have moved their operations to countries with low labor costs. IT has made such moves much easier to implement.

FIGURE 1.4 Business pressures, organizational performance and responses, and IT support.

The Changing Nature of the Workforce.   The workforce, particularly in developed countries, is becoming more diversified. Increasing numbers of women, single parents, minorities, and persons with disabilities now work in all types of positions. IT is easing the integration of these employees into the traditional workforce. IT is also enabling people to work from home.

Powerful Customers.   Consumer sophistication and expectations increase as customers become more knowledgeable about the availability and quality of products and services. Customers can use the Internet to find detailed information about products and services, compare prices, and purchase items at electronic auctions.

Organizations recognize the importance of customers and have increased their efforts to acquire and retain them. As a result, firms try to know as much as possible about their customers to better anticipate and serve their needs. This process, *customer intimacy*, is an important part of *customer relationship management* (CRM), an organization-wide effort toward maximizing the customer experience. We discuss CRM in Chapter 9.

Technology Pressures.   The second category of business pressures consists of those pressures related to technology. Two major technology-related pressures are technological innovation and information overload.

Technological Innovation and Obsolescence.   New and improved technologies rapidly create or support substitutes for products, alternative service options, and superb quality. As a result, today's state-of-the-art products may be obsolete tomorrow. For example, how quickly are you replacing your old, standard cell phones with the new smart phones? How quickly are electronic versions of books, magazines, and newspapers replacing traditional hard copy versions? These changes require businesses to keep up with consumer demands.

When TaylorMade Golf's (*www.taylormadegolf.com*) R9 driver appeared in retailers in March 2009, it was the forty-fifth new metal driver the company had produced since 2003. The company's CEO referred to the rapid product rollouts as "relentless innovation." He imported the idea from Japan where, during a business trip in 2000, he saw how Japanese golf equipment manufacturers were gaining competitive advantage over their American competitors by turning out products much more often.

In order to successfully compete, TaylorMade changed its product development process. The company spread the responsibility for product development among its 9 senior executives and the 40 managers beneath them. These 49 people come up with ideas at a rapid pace and work with each other, oftentimes in conflict, to make the ideas a reality. This process is called creative tension.

The result? In the 2009 Bob Hope Chrysler Classic golf tournament, 13 players put the TaylorMade R9 in play immediately. That is, more players used the R9 than any other driver in the tournament.

Information Overload.   The amount of information available on the Internet doubles approximately every year, and much of it is free. The Internet and other telecommunications networks are bringing a flood of information to managers. To make decisions effectively and efficiently, managers must be able to access, navigate, and utilize these vast stores of data, information, and knowledge. Information technologies, such as search engines (discussed in Chapter 5) and data mining (discussed in Chapter 11), provide valuable support in these efforts.

Societal/Political/Legal Pressures.   The third category of business pressures includes social responsibility, government regulation/deregulation, spending for social programs, spending to protect against terrorism, and ethics. In this section we consider how all of these elements affect business today.

Social Responsibility.   Social issues that affect businesses and individuals range from the state of the physical environment to company and individual philanthropy to education. Some corporations and individuals are willing to spend time and/or money on solving various social problems. These efforts are known as **organizational social responsibility** or **individual social responsibility**.

A major social problem is the state of the physical environment. A growing IT initiative, called *green IT*, is addressing environmental concerns, as the following example shows.

EXAMPLE

The Power of Green Information Technology

A large number of information technology executives at companies and government organizations are putting their technical expertise to work improving their organizations' bottom lines while improving the environment as well. The executives are using better-designed data centers, virtualization (using a single computer to run multiple programs; see Technology Guide 1), centralized computer management, and computing devices that demand less power and cooling. Let's look at some examples.

Osaka Gas (*www.osakagas.co.jp*), which serves 6.7 million natural gas customers in the Kansai region of Japan, adopted IBM's WebSphere Virtual Enterprise to provide for server virtualization. The virtualization process has reduced the gas company's electricity costs and helps protect the environment.

BancMidwest Services (*www.bancmidwest.com*), a subsidiary of Mainstreet Bank, manages assets of more than $500 million. The company centralized its storage operation and used virtualization to reduce costs and energy consumption. BancMidwest has seen its carbon footprint (a measure of the amount of carbon dioxide produced by a person, organization, or location) drop by a factor of 1,000.

Ares Management (*www.aresmgmt.com*) manages $20 billion in private equity. The company's electrical system could not keep up with the heat generated from the servers in its data center. As a result, breakers blew out two or three times every quarter. To deal with that problem, Ares virtualized its data center. The company's 3.5-ton air conditioner, previously not powerful enough to cool the data center, is now more than adequate, with energy savings averaging $8,000 per month.

The city of Las Vegas is using a centralized approach to technology to remotely turn off unused computers. The city is saving $50,000 per year with this process. The city also monitors and adjusts internal climate controls and carefully plans server positioning in the data center to take maximum advantage of cooling systems. This process has reduced power consumption by 15 percent.

Sources: Compiled from B. Behtash, "Green IT Beyond Virtualization: Storage Matters," InformationWeek; November 8, 2008; A. Diana, "The Power of Green," Baseline Magazine, July 30, 2008; J. Duffy, "Nortel Sees Green in Virtualization, Down Economy," Network World, May 1, 2008; T. Jowitt, "VMWare's 'Green' Virtualization," PC World, April 27, 2008; "BancMidwest Services Invests in Green Future with Compellent SAN," Compellent Case Study, *www.compellent.com*, accessed January 30, 2009.

Social problems all over the world may be addressed through corporate and individual philanthropy. In some cases, questions arise as to what percentage of contributions actually go to the worthy causes and persons and what percentage goes to the charity's overhead. Another problem that concerns contributors is that they often do not have a say as to what projects their contributions will support. Two organizations, Kiva and DonorsChoose, use information technology to help with these questions. IT's About Business 1.2 shows us how these two organizations are supporting a variety of needs.

Still another social problem that affects modern business is the digital divide. The **digital divide** refers to the wide gap between those who have access to information and communications technology and those who do not. This gap exists both within and among countries.

Many government and international organizations are trying to close the digital divide around the world. As technologies develop and become less expensive, the speed at which the gap can be closed will accelerate. A well-known project is the One Laptop per Child (OLPC) project that originated from MIT's Media Lab (*http://laptop.media.mit.edu*). OLPC is a non-profit association dedicated to research to develop a $100 laptop—a technology that is revolutionizing how we educate the world's children. In Chapter 7, we note how cell phones are helping to close the digital divide in developing nations.

Compliance with Government Regulations and Deregulation.   Other business pressures are related to government regulations regarding health, safety, environmental control, and equal opportunity. Businesses tend to view government regulations as expensive constraints on their activities. In general, government deregulation intensifies competition.

In the wake of 9/11 and numerous corporate scandals, the U.S. government passed many new laws, including the Sarbanes-Oxley Act, the USA PATRIOT Act, the Gramm-Leach-Bliley Act, and the Health Insurance Portability and Accountability Act. Organizations must be in compliance with

the regulations of these statutes. The process of becoming and remaining compliant is expensive and time-consuming. In almost all cases, organizations rely on IT support to provide the necessary controls and information for compliance.

Protection Against Terrorist Attacks.   Since September 11, 2001, organizations have been under increased pressure to protect themselves against terrorist attacks. In addition, employees who are in the military reserves have been called up for active duty, creating personnel problems. Information technology can help protect businesses by providing security systems and possibly identifying patterns of behavior associated with terrorist activities that will help to prevent terrorist attacks, including cyberattacks (discussed in Chapter 3), against organizations.

An example of protection against terrorism is the Department of Homeland Security's US-VISIT program. US-VISIT is a network of biometric-screening systems, such as fingerprint and ocular (eye) scanners, that ties into government databases and watch lists to check the identities of millions of people entering the United States. The system is now operational in more than 300 locations, including major international ports of entry by air, sea, and land.

Ethical Issues.   Ethics relates to general standards of right and wrong. Information ethics relates specifically to standards of right and wrong in information-processing practices. Ethical issues are very important, because if handled poorly, they can damage an organization's image and destroy its employees' morale. The use of IT raises many ethical issues, ranging from monitoring e-mail to invading the privacy of millions of customers whose data are stored in private and public databases. Chapter 3 covers ethical issues in detail.

Clearly, then, the pressures on organizations are increasing, and organizations must be prepared to take responsive actions if they are to succeed. We explore these organizational responses in the next section.

Organizational Responses

Organizations are responding to the pressures we just discussed by implementing IT such as strategic systems, customer focus, make-to-order and mass customization, and e-business. The Santa Cruz Bicycles case at the end of this chapter illustrates all of these responses. We discuss each type in greater detail in this section.

Strategic Systems.   Strategic systems provide organizations with advantages that enable them to increase their market share and/or profits, to better negotiate with suppliers, or to prevent competitors from entering their markets. IT's About Business 1.3 provides two examples of strategic systems. We see that strategic systems require a close alignment between the business and the information technology function.

Customer Focus.   Organizational attempts to provide superb customer service can make the difference between attracting and keeping customers on the one hand and losing them to competitors on the other. Numerous IT tools and business processes have been designed to keep customers happy. For example, consider Amazon. When you visit Amazon's Web site anytime after your first visit, the site welcomes you back by name and presents you with information on books that you might like, based on your previous purchases. In another example, Dell guides you through the process of buying a computer by providing information and choices that help you make an informed buying decision.

a template outlining their proposed project and its projected outcomes and then present it to the steering committee. After completion of the project, project managers must report the results of the project to the steering committee.

These processes were designed to ensure that NetApp allocated its dollars to appropriate IT investments and to enable executives to monitor progress against the company's strategic milestones. The processes also allow the company to identify business challenges and make appropriate adjustments to its IT plans to address emerging trends and technologies.

Sources: Compiled from H. McKeefry, "NetApp: Young Company, Mature IT," Baseline Magazine,

September 9, 2009; C. Preimesberger, "NetApp Reports Strong Financials," eWeek, May 21, 2008; C. Preimesberger, "NetApp Moving Up in Storage Software Market," eWeek, 2007; *www.netapp.com*, accessed April 13, 2009.

QUESTIONS

1. Consider Verizon and NetApp. Which comes first: the business strategy, or information technology? Support your answer in both cases.
2. Define business—information technology alignment and discuss how each company aligns its business strategy and its information technology function.

Make-to-Order and Mass Customization.   **Make-to-order** is a strategy of producing customized products and services. The business problem is how to manufacture customized goods efficiently and at a reasonably low cost. Part of the solution is to change manufacturing processes from mass production to mass customization. In mass production, a company produces a large quantity of identical items. In **mass customization**, it also produces a large quantity of items, but it customizes them to fit the desires of each customer. Mass customization is simply an attempt to perform make-to-order on a large scale. Bodymetrics (*www.bodymetrics.com*) is an excellent example of mass customization with men's and women's jeans.

EXAMPLE

Well-fitting jeans are notoriously difficult to find. The Bodymetrics "body scanner" scans the customer's body, captures over 150 measurements, and produces a digital replica of his or her size and shape. This accurate scan is then used to provide three services: made-to-measure jeans, body-shape jeans, and online virtual try-on.

With made-to-measure jeans, the scan is used to create a pattern for the jeans, which are hand tailored to the exact lines and contours of the customer's body. In three to six weeks, the jeans are ready and the customer has a final fitting with a Bodymetrics tailor.

Based on its experience with made-to-measure jeans, Bodymetrics has identified three body shapes: straight, semi-curvy, and curvy. Body-shape jeans are specifically designed to fit these different body shapes. After customers are scanned, a Bodymetrics jeans expert helps them determine their body shapes. Customers can then instantly purchase jeans matching their body shapes off the rack in the store.

The online virtual try-on allows customers who have been scanned to try on jeans virtually on their own bodies without physically trying on jeans in a dressing room. This service allows customers to "virtually see" how the jeans fit.

Sources: Compiled from Asmita, "Custom-Fit Jeans with Bodymetrics," *www.styleguru.com*, January 18, 2007; R. Young, "Turning Tailoring Over to a Computer," International Herald Tribune, January 15, 2007; *www.bodymetrics.com*, accessed March 1, 2009.