Part I introduces the major themes and the problem-solving approaches that are used throughout the book. While surveying the role of information systems in today's businesses, this part raises several major questions: What is an information system? Why are information systems so essential in businesses today? How can information systems help businesses become more competitive? What do I need to know about information systems to succeed in my business career?
STUDENT LEARNING OBJECTIVES
After completing this chapter, you will be able to answer the following questions:

1. How are information systems transforming business and what is their relationship to globalization?
2. Why are information systems so essential for running and managing a business today?
3. What exactly is an information system? How does it work? What are its people, organization, and technology components?
4. How will a four-step method for business problem solving help you solve information system-related problems?
5. How will information systems affect business careers and what information systems skills and knowledge are essential?
Basketball is a very fast-paced, high-energy sport but it’s also big business. Professional teams that belong to the National Basketball Association (NBA) pay each of their players an average of $5 million each year. For that amount of money, member teams expect a great deal and are constantly on the watch for ways of improving their performance. During an 82-game season, every nuance a coach can pick up about a weakness in an opponent’s offense or in the jump shot of one of his own players will translate into more points on the scoreboard, more wins, and ultimately more money for the team.

Traditional basketball game statistics failed to capture all of the details associated with every play and were not easily related to videotapes of games. As a result, decisions about changes in tactics or how to take advantage of opponents’ weaknesses were based primarily on hunches and gut instincts. Coaches could not easily answer questions such as “Which types of plays are hurting us?” Now professional basketball coaches and managers are taking their cues from other businesses and learning how to make decisions based on hard data.
A company called Synergy Sports Technology has found a way to collect and organize fine-grained statistical data and relate the data to associated video clips. Synergy employs more than 30 people to match up videos of each play with statistical information on which players have the ball, what type of play is involved, and the result. Each game is dissected and tagged, play by play, using hundreds of descriptive categories and these data are linked to high-resolution video.

Coaches then use an index to locate the exact video clip in which they are interested and access the video at a protected Web site. Within seconds they are able to watch streaming video on the protected site or they can download it to laptops and even to Apple iPods. One NBA team purchased iPods for every player so they could review videos to help them prepare for their next game.

For example, if the Dallas Mavericks have just lost to the Phoenix Suns and gave up too many fast-break points, Mavericks coaches can use Synergy’s service to see video clips of every Phoenix fast break in the game. They can also view every Dallas transitional situation for the entire season to see how that night’s game compared with others. According to Dallas Mavericks owner Mark Cuban, “The system allows us to look at every play, in every way, and tie it back to stats. So we can watch how we played every pick and roll, track our success rate, and see how other teams are doing it.”

The service helps coaches analyze the strengths and weaknesses of individual players. For example, Synergy’s system has recorded every offensive step of the Mavericks’ Dirk Nowitzki since he joined the NBA in 1998. The system can show how successfully he is driving right or left in either home or away games, with the ability to break games and player performance into increasingly finer-grained categories. If a user clicks on any statistic, that person will find video clips from the last three seasons of 20, 50, or even 2,000 plays that show Nowitzki making that particular move.

About 14 NBA teams have already signed up for Synergy’s service and are using it to help them scout for promising high school and international players. Although nothing will ever replace the need to scout players in person, the service has reduced NBA teams’ skyrocketing travel costs.


The challenges facing NBA teams show why information systems are so essential today. Like other businesses, professional basketball faces pressures from high costs, especially for team member salaries and travel to search for new talent. Teams are trying to increase revenue by improving employee performance, especially the performance of basketball team members.

The chapter-opening diagram calls attention to important points raised by this case and this chapter. To improve team performance, NBA coaches could have spent more time scrutinizing existing videos of their games, or management could have paid more money to recruit the most highly-ranked NBA players. They chose instead a new information system solution that provides them with better information to take advantage of their existing player resources.

The solution is based on an information system service provided by Synergy Sports Technology. Synergy staff members break down each game into a series of plays and then categorize each play by players, type of play, and the outcome. These data are tagged to the videos they describe to make the videos easy to search. NBA coaches and management can analyze the data to see which offensive and defensive moves are the most effective for each team player. Team members themselves can use iPods to download the videos to help them prepare for games. This innovative solution makes it possible for basketball management to use hard statistical data about players, plays, and outcomes to improve their decision making about what players should or shouldn’t do to most effectively counter their opponents.
HEADS UP

This chapter introduces you to the roles that information systems and technologies play in business firms. All firms today, large and small, local, national, and global, use information systems to achieve important business objectives, such as operational efficiency, customer and supplier intimacy, better decision making, and new products and services. Information systems and technologies will also play large roles in your career: You will need to know how to use information systems and technologies to help your firm solve problems and overcome challenges.

1.1 The Role of Information Systems in Business Today

It’s not business as usual in America any more, or the rest of the global economy. In 2007, American businesses will invest nearly $1 trillion in information systems hardware, software, and telecommunications equipment—more than half of all capital investment in the United States. In addition, they will spend another $250 billion on business and management consulting and services—much of which involves redesigning firms’ business operations to take advantage of these new technologies. More than half of all business investment in the United States each year involves information systems and technologies.

HOW INFORMATION SYSTEMS ARE TRANSFORMING BUSINESS

You can see the results of this massive spending around you every day by observing how people conduct business. More wireless cell phone accounts were opened in 2007 than telephone land lines installed. Cell phones, BlackBerrys, wireless handhelds, e-mail, and online conferencing over the Internet have all become essential tools of business. In 2007, more than 40 million businesses had dot-com Internet sites registered. Six million Americans purchase something every day on the Internet, 19 million research a product, and 38 million use a search engine. What this means is that if you and your business aren’t...
connected to the Internet and wireless networks, chances are you are not being as effective
as you could be (Pew Internet and American Life, 2007). In 2006, FedEx moved in the United States nearly 200 million packages, mostly
overnight, and the United Parcel Service (UPS) moved more than 570 million packages, as
businesses sought to sense and respond to rapidly changing customer demand, reduce
inventories to the lowest possible levels, and achieve higher levels of operational efficiency.
Supply chains have become more fast paced, with companies of all sizes depending on the
delivery of just-in-time inventory to help them compete. Companies today manage their
inventories in near real time in order to reduce their overhead costs and get to market faster.
If you are not a part of this new supply chain management economy, chances are your
business is not as efficient as it could be.

As newspaper readership continues to decline, 94 million people read at least some of
their news online. Sixty million bank online, and 55 million now read blogs, creating an
explosion of new writers, readers, and new forms of customer feedback that did not exist
before. This means your customers are empowered and talk to each other about your busi-
ness products and services. Do you have a solid online customer relationship program in
place? Is your marketing department listening?

E-commerce and Internet advertising are booming: Google’s online ad revenues
surpassed $10 billion in 2006. Internet advertising continues to grow at more than 15
percent a year, at the expense of traditional media, reaching more than $18 billion in
revenues in 2007. Is your advertising department reaching this new Web-based customer
base?

New federal security and accounting laws require many businesses to keep e-mail
messages for five years. Coupled with existing occupational and health laws requiring firms
to store employee chemical exposure data for up to 60 years, these laws are spurring the
growth of digital information now estimated to be 5 exabytes, equivalent to 37,000 Libraries
of Congress. Does your compliance department meet the minimal requirements for storing
financial, health, and occupational information? If they don’t, your entire business may be at
risk.

Briefly, it’s a new world of doing business, one that will greatly affect your future
business career. Along with the changes in business come changes in jobs and careers.
No matter whether you are a finance, accounting, management, marketing, operations
management, or information systems major, how you work, where you work, and how
well you are compensated will all be affected by business information systems.
The purpose of this book is to help you understand and benefit from these new business
realities.

GLOBALIZATION CHALLENGES AND OPPORTUNITIES: A
FLATTENED WORLD

In 1492, Columbus reaffirmed what astronomers were long saying: the world was round and
the seas could be safely sailed. As it turned out, the world was populated by peoples and
languages living in near total isolation from one another, with great disparities in economic
and scientific development. The world trade that ensued after Columbus’s voyages has
brought these peoples and cultures closer. The “industrial revolution” was really a world-
wide phenomenon energized by expansion of trade among nations.

By 2005, journalist Thomas Friedman wrote an influential book declaring the world was
now “flat,” by which he meant that the Internet and global communications had greatly
reduced the economic and cultural advantages of developed countries. U.S. and European
countries were in a fight for their economic lives, competing for jobs, markets, resources,
and even ideas with highly educated, motivated populations in low-wage areas in the less
developed world (Friedman, 2005). This “globalization” presents you and your business
with both challenges and opportunities.

A growing percentage of the economy of the United States and other advanced industrial
countries in Europe and Asia depends on imports and exports. In 2007, more than 33 percent
of the U.S. economy resulted from foreign trade, both imports and exports. In Europe and Asia, the number exceeds 50 percent. Many Fortune 500 U.S. firms derive half their revenues from foreign operations. For instance, more than half of Intel’s revenues in 2006 came from overseas sales of its microprocessors. Toys for chips: 80 percent of the toys sold in the United States are manufactured in China, while about 90 percent of the PCs manufactured in China use American-made Intel or Advanced Micro Design (AMD) chips.

It’s not just goods that move across borders. So too do jobs, some of them high-level jobs that pay well and require a college degree. In the past decade the U.S. lost several million manufacturing jobs to offshore, low-wage producers. But manufacturing is now a very small part of U.S. employment (less than 12 percent). In a normal year, about 300,000 service jobs move offshore to lower-wage countries, many of them in less-skilled information system occupations, but also including “tradable service” jobs in architecture, financial services, customer call centers, consulting, engineering, and even radiology.

On the plus side, the U.S. economy creates over 3.5 million new jobs a year, and employment in information systems, and the other service occupations listed previously, has expanded in sheer numbers, wages, productivity, and quality of work. Outsourcing has actually accelerated the development of new systems in the United States and worldwide. For the last several years there have been too few information systems majors to fill the demand of employers in the United States.

The challenge for you as a business student is to develop high-level skills through education and on-the-job experience that cannot be outsourced. The challenge for your business is to avoid markets for goods and services that can be produced offshore much less expensively. The opportunities are equally immense. You can learn how to profit from the lower costs available in world markets and the chance to serve a marketplace with billions of customers. You have the opportunity to develop higher-level and more profitable products and services. You will find throughout this book examples of companies and individuals who either failed or succeeded in using information systems to adapt to this new global environment.

What does globalization have to do with management information systems? That’s simple: everything. The emergence of the Internet into a full-blown international communications system has drastically reduced the costs of operating and transacting on a global scale. Communication between a factory floor in Shanghai and a distribution center in Rapid Falls, South Dakota, is now instant and virtually free. Customers now can shop in a worldwide marketplace, obtaining price and quality information reliably 24 hours a day. Firms producing goods and services on a global scale achieve extraordinary cost reductions by finding low-cost suppliers and managing production facilities in other countries. Internet service firms, such as Google and eBay, are able to replicate their business models and services in multiple countries without having to redesign their expensive fixed-cost information systems infrastructure. Over half of eBay’s revenues in 2007 originated outside the United States. Briefly, information systems enable globalization.

**BUSINESS DRIVERS OF INFORMATION SYSTEMS**

What makes information systems so essential today? Why are businesses investing so much in information systems and technologies? They do so to achieve six important business objectives: operational excellence; new products, services, and business models; customer and supplier intimacy; improved decision making; competitive advantage; and survival.

**Operational Excellence**

Businesses continuously seek to improve the efficiency of their operations in order to achieve higher profitability. Information systems and technologies are some of the most important tools available to managers for achieving higher levels of efficiency and productivity in business operations, especially when coupled with changes in business practices and management behavior.
Wal-Mart, the largest retailer on Earth, exemplifies the power of information systems coupled with brilliant business practices and supportive management to achieve world-class operational efficiency. In 2007, Wal-Mart achieved more than $348 billion in sales—nearly one-tenth of retail sales in the United States—in large part because of its Retail Link system, which digitally links its suppliers to every one of Wal-Mart’s 5,289 stores worldwide. As soon as a customer purchases an item, the supplier monitoring the item knows to ship a replacement to the shelf. Wal-Mart is the most efficient retail store in the industry, achieving sales of more than $28 per square foot, compared to its closest competitor, Target, at $23 a square foot, with other retail firms producing less than $12 a square foot.

### New Products, Services, and Business Models

Information systems and technologies are a major enabling tool for firms to create new products and services, as well as entirely new business models. A **business model** describes how a company produces, delivers, and sells a product or service to create wealth. Today’s music industry is vastly different from the industry in 2000. Apple Inc. transformed an old business model of music distribution based on vinyl records, tapes, and CDs into an online, legal distribution model based on its own iPod technology platform. Apple has prospered from a continuing stream of innovations, including the original iPod, the iPod nano, the iTunes music service, the iPod video player, and the iPhone.

### Customer and Supplier Intimacy

When a business really knows its customers and serves them well, the way they want to be served, the customers generally respond by returning and purchasing more. This raises revenues and profits. Likewise with suppliers: the more a business engages its suppliers, the better the suppliers can provide vital inputs. This lowers costs. How to really know your customers, or suppliers, is a central problem for businesses with millions of offline and online customers.

The Mandarin Oriental in Manhattan and other high-end hotels exemplify the use of information systems and technologies to achieve customer intimacy. These hotels use computers to keep track of guests’ preferences, such as their preferred room temperature, check-in time, frequently dialed telephone numbers, and television programs, and store these data in a giant data repository. Individual rooms in the hotels are networked to a central network server computer so that they can be remotely monitored or controlled. When a customer arrives at one of these hotels, the system automatically changes the room conditions, such as dimming the lights, setting the room temperature, or selecting appropriate...
ate music, based on the customer’s digital profile. The hotels also analyze their customer data to identify their best customers and to develop individualized marketing campaigns based on customers’ preferences.

JCPenney exemplifies the benefits of information systems-enabled supplier intimacy. Every time a dress shirt is bought at a JCPenney store in the United States, the record of the sale appears immediately on computers in Hong Kong at the TAL Apparel Ltd. supplier, a giant contract manufacturer that produces one in eight dress shirts sold in the United States. TAL runs the numbers through a computer model it developed and then decides how many replacement shirts to make, and in what styles, colors and sizes. TAL then sends the shirts to each JCPenney store, bypassing completely the retailer’s warehouses. In other words, JCPenney’s shirt inventory is near zero, as is the cost of storing it.

**Improved Decision Making**

Many business managers operate in an information fog bank, never really having the right information at the right time to make an informed decision. Instead, managers rely on forecasts, best guesses, and luck. The result is over- or underproduction of goods and services, misallocation of resources, and poor response times. These poor outcomes raise costs and lose customers. In the past 10 years, information systems and technologies have made it possible for managers to use real-time data from the marketplace when making decisions.

For instance, Verizon Corporation, one of the largest regional Bell operating companies in the United States, uses a Web-based digital dashboard to provide managers with precise real-time information on customer complaints, network performance for each locality served, and line outages or storm-damaged lines. Using this information, managers can immediately allocate repair resources to affected areas, inform consumers of repair efforts, and restore service fast.

**Competitive Advantage**

When firms achieve one or more of these business objectives—operational excellence; new products, services, and business models; customer/supplier intimacy; and improved decision making—chances are they have already achieved a competitive advantage. Doing things better than your competitors, charging less for superior products, and responding to customers and suppliers in real time all add up to higher sales and higher profits that your competitors cannot match.
In a Toyota factory, the assembly line produces a superior product in less time, using less inventory, and having fewer defects than the competition. Toyota uses information systems to monitor inventory levels and manage production scheduling.

Perhaps no other company exemplifies all of these attributes leading to competitive advantage more than Toyota Motor Company, which we discuss in the following chapter. Toyota has become the world’s largest auto maker because of its high level of efficiency and quality. Competitors struggle to keep up. Toyota’s legendary Toyota Production System (TPS) focuses on organizing work to eliminate waste, making continuous improvements, and optimizing customer value. Information systems help Toyota implement the TPS and produce vehicles based on what customers have actually ordered.

Survival
Business firms also invest in information systems and technologies because they are necessities of doing business. Sometimes these necessities are driven by industry-level changes. For instance, after Citibank introduced the first automatic teller machines (ATMs) in the New York region in 1977 to attract customers through higher service levels, its competitors rushed to provide ATMs to their customers to keep up with Citibank. Today, virtually all banks in the United States have regional ATMs and link to national and international ATM networks, such as CIRRUS. Providing ATM services to retail banking customers is simply a requirement of being in and surviving in the retail banking business.

Many federal and state statutes and regulations create a legal duty for companies and their employees to retain records, including digital records. For instance, the Toxic Substances Control Act (1976), which regulates the exposure of U.S. workers to more than 75,000 toxic chemicals, requires firms to retain records on employee exposure for 30 years. The Sarbanes-Oxley Act (2002), which was intended to improve the accountability of public firms and their auditors, requires public companies to retain audit working papers and records, including all e-mails, for five years. Firms turn to information systems and technologies to provide the capability to respond to these information retention and reporting requirements.

1.2 Perspectives on Information Systems and Information Technology

So far we’ve used information systems and technologies informally without defining the terms. Information technology (IT) consists of all the hardware and software that a firm needs to use in order to achieve its business objectives. This includes not only computer machines, disk drives, handheld personal digital assistants, and, yes, even iPods (where they are used for a business purpose) but also software, such as the Windows or Linux operating systems, the Microsoft Office desktop productivity suite, and the many thousands of
computer programs that can be found in a typical large firm. “Information systems” are more complex and can be best be understood by looking at them from both a technology and a business perspective.

**WHAT IS AN INFORMATION SYSTEM?**

An information system (IS) can be defined technically as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organization. In addition to supporting decision making, coordination, and control, information systems may also help managers and workers analyze problems, visualize complex subjects, and create new products.

Information systems contain information about significant people, places, and things within the organization or in the environment surrounding it. By information we mean data that have been shaped into a form that is meaningful and useful to human beings. Data, in contrast, are streams of raw facts representing events occurring in organizations or the physical environment before they have been organized and arranged into a form that people can understand and use.

A brief example contrasting information and data may prove useful. Supermarket checkout counters scan millions of pieces of data, such as bar codes, that describe the product. Such pieces of data can be totaled and analyzed to provide meaningful information, such as the total number of bottles of dish detergent sold at a particular store, which brands of dish detergent were selling the most rapidly at that store or sales territory, or the total amount spent on that brand of dish detergent at that store or sales region (see Figure 1-1).

Three activities in an information system produce the information that organizations need to make decisions, control operations, analyze problems, and create new products or services. These activities are input, processing, and output (see Figure 1-2). Input captures or collects raw data from within the organization or from its external environment. Processing converts this raw input into a meaningful form. Output transfers the processed information to the people who will use it or to the activities for which it will be used.
Information systems also require **feedback**, which is output that is returned to appropriate members of the organization to help them evaluate or correct the input stage.

In the NBA teams’ system for analyzing basketball moves, there are actually two types of raw input. One consists of all the statistics about each play entered by Synergy Sports Technology’s staff members—the player’s name, team, date of game, game location, type of play, other players involved in the play, and the outcome. The other input consists of videos of the plays and games, which are captured as digital points of data for storage, retrieval, and manipulation by the computer.

Synergy Sports Technology server computers store these data and process them to relate data such as the player’s name(s), type of play, and outcome to a specific video clip. The output consists of videos and statistics about specific players, teams, and plays. The system provides meaningful information, such as the number and type of defensive plays that were successful against a specific player, what types of offensive plays were the most successful against a specific team, or comparisons of individual player and team performance in home and away games.

Although computer-based information systems use computer technology to process raw data into meaningful information, there is a sharp distinction between a computer and a computer program and an information system. Electronic computers and related software programs are the technical foundation, the tools and materials, of modern information systems. Computers provide the equipment for storing and processing information. Computer programs, or software, are sets of operating instructions that direct and control computer processing. Knowing how computers and computer programs work is important in designing solutions to organizational problems, but computers are only part of an information system.

A house is an appropriate analogy. Houses are built with hammers, nails, and wood, but these do not make a house. The architecture, design, setting, landscaping, and all of the decisions that lead to the creation of these features are part of the house and are crucial for solving the problem of putting a roof over one’s head. Computers and programs are the hammer, nails, and lumber of computer-based information systems, but alone they cannot produce the information a particular organization needs. To understand information...
systems, you must understand the problems they are designed to solve, their architectural and design elements, and the organizational processes that lead to these solutions.

IT ISN’T SIMPLY TECHNOLOGY: THE ROLE OF PEOPLE AND ORGANIZATIONS

To fully understand information systems, you will need to be aware of the broader organization, people, and information technology dimensions of systems (see Figure 1-3) and their power to provide solutions to challenges and problems in the business environment. We refer to this broader understanding of information systems, which encompasses an understanding of the people and organizational dimensions of systems as well as the technical dimensions of systems, as information systems literacy. Information systems literacy includes a behavioral as well as a technical approach to studying information systems. Computer literacy, in contrast, focuses primarily on knowledge of information technology.

The field of management information systems (MIS) tries to achieve this broader information systems literacy. MIS deals with behavioral issues as well as technical issues surrounding the development, use, and impact of information systems used by managers and employees in the firm.

DIMENSIONS OF INFORMATION SYSTEMS

Let’s examine each of the dimensions of information systems—organizations, people, and information technology.

Organizations

Information systems are an integral part of organizations. And although we tend to think about information technology changing organizations and business firms, it is, in fact, a two-way street: The history and culture of business firms also affects how the technology is used and how it should be used. In order to understand how a specific business firm uses information systems, you need to know something about the structure, history, and culture of the company.

Organizations have a structure that is composed of different levels and specialties. Their structures reveal a clear-cut division of labor. A business firm is organized as a hierarchy, or a pyramid structure, of rising authority and responsibility. The upper levels of the hierarchy consist of managerial, professional, and technical employees, whereas the lower levels consist of operational personnel. Experts are employed and trained for different business functions, such as sales and marketing, manufacturing and production, finance and accounting,
and human resources. Information systems are built by the firm in order to serve these different specialties and different levels of the firm. Chapter 2 provides more detail on these business functions and organizational levels and the ways in which they are supported by information systems.

An organization accomplishes and coordinates work through this structured hierarchy and through its business processes, which are logically related tasks and behaviors for accomplishing work. Developing a new product, fulfilling an order, or hiring a new employee are examples of business processes.

Most organizations’ business processes include formal rules that have been developed over a long time for accomplishing tasks. These rules guide employees in a variety of procedures, from writing an invoice to responding to customer complaints. Some of these business processes have been written down, but others are informal work practices, such as a requirement to return telephone calls from co-workers or customers, that are not formally documented. Information systems automate many business processes. For instance, how a customer receives credit or how a customer is billed is often determined by an information system that incorporates a set of formal business processes.

Each organization has a unique culture, or fundamental set of assumptions, values, and ways of doing things, that has been accepted by most of its members. Parts of an organization’s culture can always be found embedded in its information systems. For instance, the United Parcel Service’s concern with placing service to the customer first is an aspect of its organizational culture that can be found in the company’s package tracking systems.

Different levels and specialties in an organization create different interests and points of view. These views often conflict. Conflict is the basis for organizational politics. Information systems come out of this cauldron of differing perspectives, conflicts, compromises, and agreements that are a natural part of all organizations.

**People**

A business is only as good as the people who work there and run it. Likewise with information systems—they are useless without skilled people to build and maintain them, and without people who can understand how to use the information in a system to achieve business objectives.

For instance, a call center that provides help to customers using an advanced customer relationship management system (described in later chapters) is useless if employees are not adequately trained to deal with customers, find solutions to their problems, and leave the customer feeling that the company cares for them. Likewise, employee attitudes about their jobs, employers, or technology can have a powerful effect on their abilities to use information systems productively.

Business firms require many different kinds of skills and people, including managers as well as rank-and-file employees. The job of managers is to make sense out of the many situations faced by organizations, make decisions, and formulate action plans to solve organizational problems. Managers perceive business challenges in the environment; they set the organizational strategy for responding to those challenges; and they allocate the human and financial resources to coordinate the work and achieve success. Throughout, they must exercise responsible leadership.

But managers must do more than manage what already exists. They must also create new products and services and even re-create the organization from time to time. A substantial part of management responsibility is creative work driven by new knowledge and information. Information technology can play a powerful role in helping managers develop novel solutions to a broad range of problems.

As you will learn throughout this text, technology is today relatively inexpensive, but people are very expensive. Because people are the only ones capable of business problem solving and converting information technology into useful business solutions, we spend considerable effort in this text looking at the people dimension of information systems.
Technology

Information technology is one of many tools managers use to cope with change. **Computer hardware** is the physical equipment used for input, processing, and output activities in an information system. It consists of the following: computers of various sizes and shapes; various input, output, and storage devices; and telecommunications devices that link computers together.

**Computer software** consists of the detailed, preprogrammed instructions that control and coordinate the computer hardware components in an information system. Chapter 4 describes the contemporary software and hardware platforms used by firms today in greater detail.

**Data management technology** consists of the software governing the organization of data on physical storage media. More detail on data organization and access methods can be found in Chapter 5.

**Networking and telecommunications technology**, consisting of both physical devices and software, links the various pieces of hardware and transfers data from one physical location to another. Computers and communications equipment can be connected in networks for sharing voice, data, images, sound, and video. A network links two or more computers to share data or resources, such as a printer.

The world’s largest and most widely used network is the **Internet**. The Internet is a global “network of networks” that uses universal standards (described in Chapter 6) to connect millions of different networks in over 200 countries around the world.

The Internet has created a new “universal” technology platform on which to build new products, services, strategies, and business models. This same technology platform has internal uses, providing the connectivity to link different systems and networks within the firm. Internal corporate networks based on Internet technology are called **intranets**. Private intranets extended to authorized users outside the organization are called **extranets**, and firms use such networks to coordinate their activities with other firms for making purchases, collaborating on design, and performing other interorganizational work. For most business firms today, using Internet technology is a business necessity and a competitive advantage.

The **World Wide Web** is a service provided by the Internet that uses universally accepted standards for storing, retrieving, formatting, and displaying information in a page format on the Internet. Web pages contain text, graphics, animations, sound, and video and are linked to other Web pages. By clicking on highlighted words or buttons on a Web page, you can link to related pages to find additional information and links to other locations on the Web. The Web can serve as the foundation for new kinds of information systems such as UPS’s Web-based package tracking system or Synergy Sports Technology’s online service for delivering video linked to NBA team statistics.

All of these technologies, along with the people required to run and manage them, represent resources that can be shared throughout the organization and constitute the firm’s **information technology (IT) infrastructure**. The IT infrastructure provides the foundation, or **platform**, on which the firm can build its specific information systems. Each organization must carefully design and manage its information technology infrastructure so that it has the set of technology services it needs for the work it wants to accomplish with information systems. Chapters 4 through 7 of this text examine each major technology component of information technology infrastructure and show how they all work together to create the technology platform for the organization.

The Interactive Session on Technology describes some of the typical technologies used in computer-based information systems today. UPS invests heavily in information systems technology to make its business more efficient and customer oriented. It uses an array of information technologies including bar code scanning systems, wireless networks, large mainframe computers, handheld computers, the Internet, and many different pieces of software for tracking packages, calculating fees, maintaining customer accounts, and managing logistics. As you read this case, try to identify the problem this company was facing, what alternative solutions were available to management, and how well the chosen solution worked.
United Parcel Service (UPS) started out in 1907 in a closet-sized basement office. Jim Casey and Claude Ryan—two teenagers from Seattle with two bicycles and one phone—promised the “best service and lowest rates.” UPS has used this formula successfully for more than a century to become the world’s largest ground and air package-distribution company. It is a global enterprise with more than 400,000 employees, 92,000 vehicles, and the world’s eighth largest airline.

Today, UPS delivers more than 15 million parcels and documents each day in the United States and more than 200 other countries and territories. The firm has been able to maintain leadership in small-package delivery services despite stiff competition from FedEx and Airborne Express by investing heavily in advanced information technology. UPS spends more than $1 billion each year to maintain a high level of customer service while keeping costs low and streamlining its overall operations.

It all starts with the scannable bar-coded label attached to a package, which contains detailed information about the sender, the destination, and when the package should arrive. Customers can download and print their own labels using special software provided by UPS or by accessing the UPS Web site. Before the package is even picked up, information from the “smart” label is transmitted to one of UPS’s computer centers in Mahwah, New Jersey, or Alpharetta, Georgia and sent to the distribution center nearest its final destination. Dispatchers at this center download the label data and use special software to create the most efficient delivery route for each driver that considers traffic, weather conditions, and the location of each stop. UPS estimates its delivery trucks saved 28 million miles and 3 million gallons of fuel in 2006 compared to the year before as a result of using this technology.

The first thing a UPS driver picks up each day is a handheld computer called a Delivery Information Acquisition Device (DIAD), which can access one of the wireless networks cell phones rely on. As soon as the driver logs on, his or her day’s route is downloaded onto the handheld. The DIAD also automatically captures customers’ signatures along with pickup and delivery information. Package tracking information is then transmitted to UPS’s computer network for storage and processing. From there, the information can be accessed worldwide to provide proof of delivery to customers or to respond to customer queries. It usually takes less than 60 seconds from the time a driver presses “complete” on the DIAD for the new information to be available on the Web.

Through its automated package tracking system, UPS can monitor and even re-route packages throughout the delivery process. At various points along the route from sender to receiver, bar code devices scan shipping information on the package label and feed data about the progress of the package into the central computer. Customer service representatives are able to check the status of any package from desktop computers linked to the central computers and respond immediately to inquiries from customers. UPS customers can also access this information from the company’s Web site using their own computers or wireless devices.

Anyone with a package to ship can access the UPS Web site to track packages, check delivery routes, calculate shipping rates, determine time in transit, print labels, and schedule a pickup. The data collected at the UPS Web site are transmitted to the UPS central computer and then back to the customer after processing. UPS also provides tools that enable customers, such as Cisco Systems, to embed UPS functions, such as tracking and cost calculations, into their own Web sites so that they can track shipments without visiting the UPS site.

UPS is now leveraging its decades of expertise managing its own global delivery network to manage logistics and supply-chain management for other companies. It created a UPS Supply Chain Solutions division that provides a complete bundle of standardized services to subscribing companies at a fraction of what it would cost to build their own systems and infrastructure. These services include supply-chain design and management, freight forwarding, customs brokerage, mail services, multimodal transportation, and financial services, in addition to logistics services.

Hired Hand Technologies, a Bremen, Alabama-based manufacturer of agricultural and horticultural equipment, uses UPS Freight services not only to track shipments but also to build its weekly manufacturing plans. UPS provides up-to-the-minute information about exactly when parts are arriving within 20 seconds.

Let’s identify the organization, people, and technology elements in the UPS package tracking system we have just described. The organization element anchors the package tracking system in UPS’s sales and production functions (the main product of UPS is a service—package delivery). It specifies the required procedures for identifying packages with both sender and recipient information, taking inventory, tracking the packages en route, and providing package status reports for UPS customers and customer service representatives.

The system must also provide information to satisfy the needs of managers and workers. UPS drivers need to be trained in both package pickup and delivery procedures and in how to use the package tracking system so that they can work efficiently and effectively.

Explore the UPS Web site (www.ups.com) and answer the following questions:

1. What kind of information and services does the Web site provide for individuals, small businesses, and large businesses? List these services and write several paragraphs describing one of them, such as UPS Trade Direct or Automated Shipment Processing. Explain how you or your business would benefit from the service.

2. Explain how the Web site helps UPS achieve some or all of the strategic business objectives we described earlier in this chapter. What would be the impact on UPS’s business if this Web site were not available?
UPS customers may need some training to use UPS in-house package tracking software or the UPS Web site.

UPS’s management is responsible for monitoring service levels and costs and for promoting the company’s strategy of combining low cost and superior service. Management decided to use automation to increase the ease of sending a package using UPS and of checking its delivery status, thereby reducing delivery costs and increasing sales revenues.

The technology supporting this system consists of handheld computers, bar code scanners, wired and wireless communications networks, desktop computers, UPS’s central computer, storage technology for the package delivery data, UPS in-house package tracking software, and software to access the World Wide Web. The result is an information system solution to the business challenge of providing a high level of service with low prices in the face of mounting competition.

1.3 Understanding Information Systems: A Business Problem-Solving Approach

Our approach to understanding information systems is to consider information systems and technologies as solutions to a variety of business challenges and problems. We refer to this as a “problem-solving approach.” Businesses face many challenges and problems, and information systems are one major way of solving these problems. All of the cases in this book illustrate how a company used information systems to solve a specific problem.

The problem-solving approach has direct relevance to your future career. Your future employers will hire you because you are able to solve business problems and achieve business objectives. Your knowledge of how information systems contribute to problem solving will be very helpful to both you and your employers.

THE PROBLEM-SOLVING APPROACH

At first glance, problem solving in daily life seems to be perfectly straightforward: A machine breaks down, parts and oil spill all over the floor, and, obviously, somebody has to do something about it. So, of course, you find a tool around the shop and start repairing the machine. After a cleanup and proper inspection of other parts, you start the machine, and production resumes.

No doubt some problems in business are this straightforward. But few problems are this simple in the real world of business. In real-world business firms, a number of major factors are simultaneously involved in problems. These major factors can usefully be grouped into three categories: organization, technology, and people. In other words, a whole set of problems is usually involved.

A MODEL OF THE PROBLEM-SOLVING PROCESS

There is a simple model of problem solving that you can use to help you understand and solve business problems using information systems. You can think of business problem-solving as a four-step process (see Figure 1-4). Most problem solvers work through this model on their way to finding a solution. Let’s take a brief look at each step.

Problem Identification

The first step in the problem-solving process is to understand what kind of problem exists. Contrary to popular beliefs, problems are not like basketballs on a court simply waiting to be picked up by some “objective” problem solver. Before problems can be solved, there must be agreement in a business that a problem exists, about what the problem is, about what its causes are, and about what can be done about the problem given the limited resources of the organization. Problems have to be properly defined by people in an organization before they can be solved.
For instance, what at first glance what might seem like a problem with employees not adequately responding to customers in a timely and accurate manner might in reality be a result of a older, out-of-date information system for keeping track of customers. Or it might be a combination of both poor employee incentives for treating customers well and an outdated system. Once you understand this critical fact, you can start to solve problems creatively. Finding answers to these questions will require fact gathering, interviews with people involved in the problem, and analysis of documents.

In this text, we emphasize three different and typical dimensions of business problems: organizations, technology, and people (see Table 1.1). Typical organizational problems include poor business processes (usually inherited from the past), unsupportive culture, political in-fighting, and changes in the organization’s surrounding environment. Typical technology problems include insufficient or aging hardware, outdated software, inadequate database capacity, insufficient telecommunications capacity, and the incompatibility of old systems with new technology. Typical people problems include employee training, difficulties of evaluating performance, legal and regulatory compliance, ergonomics, poor or indecisive management, and employee support and participation. When you begin to analyze a business problem, you will find these dimensions are helpful guides to understanding the kind of problem with which you are working.

**Solution Design**
The second step is to design solutions to the problem(s) you have identified. As it turns out, there are usually a great many “solutions” to any given problem, and the choice of solution often reflects the differing perspectives of people in an organization. You should try to consider as many different solutions as possible so that you can understand the range of possible solutions. Some solutions emphasize technology; others focus on change in the organization and people aspects of the problem. As you will find throughout the text, most successful solutions result from an integrated approach in which new technologies are accompanied by changes in organization and people.

**Choice**
Choosing the “best” solution for your business firm is the next step in the process. Some of the factors to consider when trying to find the “best” single solution are the cost of the
solution, the feasibility of the solution for your business given existing resources and skills, and the length of time required to build and implement the solution. Also very important at this point are the attitudes and support of your employees and managers. A solution that does not have the support of all the major interests in the business can quickly turn into a disaster.

**Implementation**

The best solution is one that can be implemented. Implementation of an information system solution involves building the solution and introducing it into the organization. This includes purchasing or building the software and hardware—the technology part of the equation. The software must be tested in a realistic business setting; then employees need to be trained, and documentation about how to use the new system needs to be written.

You will definitely need to think about change management. **Change management** refers to the many techniques used to bring about successful change in a business. Nearly all information systems require changes in the firm’s business processes and, therefore, changes in what hundreds or even thousands of employees do every day. You will have to design new, more efficient business processes, and then figure out how to encourage employees to adapt to these new ways of doing business. This may require meeting sessions to introduce the change to groups of employees, new training modules to bring employees quickly up to speed on the new information systems and processes, and finally some kind of rewards or incentives to encourage people to enthusiastically support the changes.

Implementation also includes the measurement of outcomes. After a solution has been implemented, it must be evaluated to determine how well it is working and whether any additional changes are required to meet the original objectives. This information is fed back to the problem solvers. In this way, the identification of the problem can change over time, solutions can be changed, and new choices made, all based on experience.

**Problem Solving: A Process, Not an Event**

It is often assumed that once a problem is “solved,” it goes away and can be forgotten about. And it is easy to fall into the trap of thinking about problem solving as an event that is “over”
at some point, like a relay race or a baseball game. Often in the real world this does not happen. Sometimes the solution chosen does not work, and new solutions are required.

For instance, the U.S. National Aeronautics and Space Administration (NASA) spent more than $1 billion to fix a problem with shedding foam on the space shuttle. Experience proved the initial solution did not work. More often, the chosen solution partially works but needs a lot of continuous changes to truly “fit” the situation. Initial solutions are often rough approximations at first of what ultimately “works.” Sometimes, the nature of the problem changes in a way that makes the initial solution ineffective. For instance, hackers create new variations on computer viruses that require continually evolving antivirus programs to hold in check. For all these reasons, problem solving is a continuous process rather than a single event.

THE ROLE OF CRITICAL THINKING IN PROBLEM SOLVING

It is amazingly easy to accept someone else’s definition of a problem or to adopt the opinions of some authoritative group that has “objectively” analyzed the problem and offers quick solutions. You should try to resist this tendency to accept existing definitions of any problem. Through the natural flow of decision making, it is essential that you try to maintain some distance from any specific solution until you are sure you have properly identified the problem, developed understanding, and analyzed alternatives. Otherwise, you may leap off in the wrong direction, solve the wrong problem, and waste resources. You will have to engage in some critical-thinking exercises.

Critical thinking can be briefly defined as the sustained suspension of judgment with an awareness of multiple perspectives and alternatives. It involves at least four elements:

- Maintaining doubt and suspending judgment
- Being aware of different perspectives
- Testing alternatives and letting experience guide
- Being aware of organizational and personal limitations

Simply following a rote pattern of decision making, or a model, does not guarantee a correct solution. The best protection against incorrect results is to engage in critical thinking throughout the problem-solving process.

First, maintain doubt and suspend judgment. Perhaps the most frequent error in problem solving is to arrive prematurely at a judgment about the nature of the problem. By doubting all solutions at first and refusing to rush to a judgment, you create the necessary mental conditions to take a fresh, creative look at problems, and you keep open the chance to make a creative contribution.

Second, recognize that all interesting business problems have many dimensions and that the same problem can be viewed from different perspectives. In this text, we have emphasized the usefulness of three perspectives on business problems: technology, organizations, and people. Within each of these very broad perspectives are many subperspectives, or views. The technology perspective, for instance, includes a consideration of all the components in the firm’s IT infrastructure and the way they work together. The organization perspective includes a consideration of a firm’s business processes, structure, culture, and politics. The people perspective includes consideration of the firm’s management, as well as employees as individuals and their interrelationships in workgroups.

You will have to decide for yourself which major perspectives are useful for viewing a given problem. The ultimate criterion here is usefulness: Does adopting a certain perspective tell you something more about the problem that is useful for solving the problem? If not, reject that perspective as being not meaningful in this situation and look for other perspectives.

The third element of critical thinking involves testing alternatives, or modeling solutions to problems, letting experience be the guide. Not all contingencies can be known in advance, and much can be learned through experience. Therefore, experiment, gather data, and reassess the problem periodically.
THE CONNECTION BETWEEN BUSINESS OBJECTIVES, PROBLEMS, AND SOLUTIONS

Now let’s make the connection between business information systems and the problem-solving approach. At the beginning of this chapter we talked about the six reasons business firms invest in information systems and technologies. We identified six business objectives of information systems: operational excellence; new products, services, and business models; customer/supplier intimacy; improved decision making; strategic advantage; and survival. When firms cannot achieve these objectives, they become “challenges” or “problems” that receive attention. Managers and employees who are aware of these challenges often turn to information systems as one of the solutions, or the entire solution.

Review the diagram at the beginning of this chapter. The diagram shows how NBA teams’ systems solved the business problem presented by intense competitive pressures of professional sports, the high cost of professional basketball players, and incomplete data on team and player performance. Its system provides a solution that takes advantage of computer capabilities for processing digital video data and linking them to team and player data. It helps NBA coaches and managers make better decisions about how to best use the talents of their players in both offensive and defensive maneuvers. The diagram also illustrates how people, technology, and organizational elements work together to create the systems.

Each chapter of this text begins with a diagram similar to this one to help you analyze the chapter-opening case. You can use this diagram as a starting point for analyzing any information system or information system problem you encounter.

Let’s try to use what you have learned about problem-solving in the following Interactive Session. Saks Fifth Avenue, a leading U.S. luxury retail department store chain, was struggling to achieve profitability and hold on to market share. As you read this case ask yourself: Why was Saks experiencing this problem? What was the source of the problem? What caused the problem? What alternative solutions were available to management? What people, organization, and technology issues had to be addressed to solve the problem?

1.4 Information Systems and Your Career

Looking out to 2012, the U.S. economy will create 21.6 million new jobs, and 28.5 million existing jobs will open up as their occupants retire. More than 95 percent of the new jobs will be created in the service sector. Many of these new jobs and replacement jobs will require a college degree to perform (Statistical Abstract, 2006-2007; U.S. Bureau of Labor Statistics, 2006).

What this means is that U.S. business firms are looking for candidates who have a broad range of problem-solving skills—the ability to read, write, and present ideas—as well as the technical skills required for specific tasks. Regardless of your business school major, or your future occupation, information systems and technologies will play a major and expanding role in your day-to-day work and your career. Your career opportunities, and your compensation, will in part depend on your ability to help business firms use information systems to achieve their objectives.

HOW INFORMATION SYSTEMS WILL AFFECT BUSINESS CAREERS

In the following sections, we describe how specific occupations will be affected by information systems and what skills you should be building in order to function effectively in this new, emerging labor market. Let’s look at the career opportunities for business school majors.

Accounting

There are about 1.1 million accountants in the U.S. labor force today, and the field is expected to expand by 20 percent to the year 2012, adding 200,000 new jobs, and a similar
INTERACTIVE SESSION: PEOPLE

How Can Saks Know Its Customers?

Since 1924, Saks Fifth Avenue has worked hard to lure shoppers into its stores. And for many years it did, delivering high-end, unique, and fashionable luxury merchandise. Most Saks stores are freestanding entities in high-profile shopping destinations or anchor stores in upscale malls. A shopper at Saks can expect to find an array of luxury apparel, shoes, accessories, jewelry, cosmetics, and gift items. Saks Fifth Avenue Enterprises conducts its merchandising, sales promotion, and store operating support functions for 54 locations around the United States from corporate offices in New York City.

But times have changed and luxury retailing has become a very crowded field. For the past decade the company has lost market share and sales to Neiman Marcus, Nordstrom, and other high-end retailers. Management tried to improve financial results by minimizing inventory. A walk through a typical Saks store in 2005 would have revealed holes in cosmetics cases where lipsticks were out of stock and basic men’s dress shirts that were sold out. Even worse, what inventory stores carried turned off many shoppers because the focus was on young women with what one analyst called a “Hollywood bling-bluing look.”

What Saks lacked was an accurate picture of its customers. It hasn’t fully figured out who are its core customers and how their buying preferences differ in Saks stores around the country. For example, the core shopper at Saks’ New York store is in her mid-forties, preferring a largely “classic” style for work and slightly more modern looks for going out and for weekend wear. Saks’ New York store is its flagship, generating approximately 20 percent of the company’s annual revenue. But Saks’ selection elsewhere was too New York-centric. In Birmingham, Alabama, customers were slightly younger and less conservative in taste, and traveled to Atlanta to buy designer clothing and handbags. The Saks Short Hills New Jersey store didn’t carry enough high-end merchandise or clothing for men. Working women visit the Stamford store, but the nearby Greenwich location receives a greater number of women who do not work. Shoppers on the Saks Web site, which is the company’s second largest source of revenue, are about seven years younger than the typical Saks customer and spend more per transaction.

In January 2006, Stephen Sadove was named Saks CEO and charged with turning the company around. Whereas some companies might choose to increase revenue by opening more stores, Saks focused on wringing more value from existing facilities. Sadove earmarked between $125 million and $150 million annually for store renovations. To help determine which merchandise to send to which stores, Sadove and his team developed a nine-box grid that cross-references the most popular styles at each store with the most common spending levels. The styles are categorized as Park Avenue for classic, uptown for modern, and Soho for trendy. Merchandise prices are categorized as good, better, and best, with very high-end items from designers such as Chanel, Gucci, Louis Vuitton, Oscar de la Renta, and Bill Blass filling in the “best” category. The grid will help Saks customize the inventory for each store and stock each with the optimum blend of goods. Saks watches the profitability and sales histories associated with its many vendors carefully.

The new strategy has already begun to bear fruit. Saks president and chief merchandising officer Ron Frasch says that the new approach to stocking has brought about “tremendous response.” For example, the Saks Fifth Avenue flagship store in New York spent the first half of 2007 boosting the number of women’s designer shoes it carries by almost 60 percent because shoes are one of the “hot areas in the store” right now. The most recent financial data for Saks Inc. show a net income of $54 million on revenues of $2.9 billion. Saks stores that were open for at least a year showed greater improvements in sales than the stores of chief rival Neiman Marcus.

The differences among the stores even permeate marketing strategy at Saks. National marketing campaigns have been complicated by the fact that fashion trends do not have equal appeal across the country. Saks is planning to place more emphasis on customized marketing for individual markets. The company is also experimenting with a computer system that helps the sales staff monitor the buying habits of customers so that the staff can be more productive. Management has declared that investments in technology are necessary for the success of the company’s business and strategy, and therefore Saks will continue to upgrade its information systems with the goal of greater efficiency and productivity.

CASE STUDY QUESTIONS

1. What is the problem affecting the performance of Saks?
2. What information does Saks need to solve this problem? What other pieces of data does Saks need in addition to those in its nine-box grid?
3. Where can Saks acquire this information?
4. What role should managers and employees have in designing the solution?
5. Design a report that represents the information Saks needs to implement its merchandising strategy.
6. How might a better understanding of customer preferences support Saks’ strategy of improving existing facilities?

MIS IN ACTION

1. Explore the Saks Fifth Avenue Web site (www.saks.com). What are some of the features of the Web site that make it useful for selling luxury goods?
2. What information about customers can be collected at the Web site that would help Saks stock the items that customers want?

Accountants can be broadly classified as public accountants, management accountants, government accountants, and internal auditors. Accountants provide a broad range of services to business firms including preparing, analyzing, and verifying financial documents; budget analysis; financial planning; information technology consulting; and limited legal services. A new specialty called “forensic accounting” investigates white-collar crimes, such as securities fraud and embezzlement, bankruptcies and contract disputes, and other possibly criminal financial transactions.

Accountants increasingly rely on information systems to summarize transactions, create financial records, organize data, and perform financial analysis. In fact, there is no way that firms today can perform even basic accounting functions without extensive investment in systems. As a result of new public laws, accountants are beginning to perform more technical duties, such as implementing, controlling, and auditing systems and networks, and developing technology plans and budgets.

What kinds of information system skills are really important for accounting majors given these changes in the accounting profession? Here is a short list:

- Knowledge of current and likely future changes in information technology, including hardware, software, and telecommunications, which will be used by public and private firms, government agencies, and financial advisors as they perform auditing and accounting functions. Also essential is an understanding of accounting and financial applications and design factors to ensure firms are able to maintain accounting records and perform auditing functions, and an understanding of system and network security issues, which are vital to protect the integrity of accounting systems.

- Understanding of enterprise systems capabilities for corporate-wide financial reporting on a global and national scale. Because so many transactions are occurring over the Internet, accountants need to understand online transaction and reporting systems, and how systems are used to achieve management accounting functions in an online, wireless, and mobile business environment.
Finance
Finance majors perform a wide variety of jobs in the U.S. economy. Financial managers develop financial reports, direct investment activities, and implement cash management strategies. There are about 600,000 financial managers in the U.S. labor force and this occupation is expected to grow by about 20 percent by 2012, adding about 120,000 new jobs and requiring the replacement of about 100,000 additional jobs.

Financial managers require strong system skills and play important roles in planning, organizing, and implementing information system strategies for their firms. Financial managers work directly with a firm’s board of directors and senior management to ensure investments in information systems help achieve corporate goals and achieve high returns. The relationship between information systems and the practice of modern financial management and services is so strong that many advise finance majors to also co-major in information systems (and vice versa).

What kinds of information system skills should finance majors develop? Following is brief list:

• An understanding of likely future changes in information technology, including hardware, software, and telecommunications, that will be used by financial managers and financial service firms. This includes an understanding of financial applications and design factors to ensure firms are able to manage their investments, cash, and risks; new kinds of mobile and wireless applications to manage financial reporting; and development of online systems for financial transactions. As new trading systems emerge, financial service firms and managers will need to understand how these systems work and how they will change their firm’s business.

• Knowledge of the new role played by enterprise-wide financial reporting systems on a global and national scale. As more and more transactions move online, finance majors need to understand online transaction reporting systems and management of online system investments.

Marketing
No field has undergone more technology-driven change in the past five years than marketing and advertising. The explosion in e-commerce activity described earlier in this chapter means that eyeballs are moving rapidly to the Internet. As a result, Internet advertising is the fastest-growing form of advertising, expanding at more than 30 percent annually and reaching $13 billion in 2006. (Other forms of marketing communications are growing at a much slower 5 percent rate.) All this means that branding products and communicating with customers are moving online at a fast pace.
There are about 900,000 marketing, public relations, sales, and advertising managers in the U.S. labor force. This field is growing faster than average and is expected to add more than 200,000 jobs by 2012 and replace an additional 150,000 employees who are retiring. There is a much larger group of 2.6 million nonmanagerial employees in marketing-related occupations (art, design, entertainment, sports, and media) and more than 15.9 million employees in sales. These occupations together are expected to create an additional 1.8 million jobs by 2012.

Here are some of the general information systems skills on which marketing majors should focus:

- An ability to understand Internet and marketing database systems, and how they impact traditional marketing activities, such as brand development, production promotion, and sales. This would include an understanding of design factors to ensure firms are able to market their products, develop reports on product performance, retrieve feedback from customers, and manage product development.
- An understanding of how enterprise wide-systems for product management, sales force management, and customer relationship management are used to develop products that consumers want, to manage the customer relationship, and to manage an increasingly mobile sales force.

Operations Management in Services and Manufacturing
The growing size and complexity of modern industrial production and the emergence of huge global service companies have created a growing demand for employees who can coordinate and optimize the resources required to produce goods and services. Operations management as a discipline is directly relevant to three occupational categories: industrial production managers, administrative service managers, and operations analysts.

Production managers, administrative service managers and operations analysts will be employing information systems and technologies every day to accomplish their jobs, with extensive use of database and analytical software. Here are the general information systems skills on which operations management majors should focus:

- Knowledge of the changing hardware and software platforms that will be used in operations management. This would include an understanding of the role that databases, modeling tools, and business analytical software play in production and services management.
- An in-depth understanding of how enterprise-wide information systems for production management, supplier management, sales force management, and customer relationship management are used to achieve efficient operations and meet other firm objectives.

Management
Management is the largest single group in the U.S. business labor force with more than 14 million members, not including an additional 547,000 management consultants. Overall, the management corps in the United States is expected to expand faster than other occupational groups, adding about 3.8 million new jobs by 2012, with about 2 million replacement openings in this period as a result of retirements. There are more than 20 different types of managers tracked by the Bureau of Labor Statistics, all the way from chief executive officer, to human resource managers, production managers, project managers, lodging managers, medical managers, and community service managers.

The job of management has been transformed by information systems, and, arguably, it would be impossible to manage business firms today without the extensive use of information systems, even very small firms. Nearly all of the 14 million managers in the United States use information systems and technologies everyday to accomplish their jobs, from desktop productivity tools to applications coordinating the entire enterprise. Here are the general information systems skills on which management majors should focus:

- Knowledge of new hardware and software that can make management more efficient and effective, enhance leadership and coordination capabilities, and improve the
achievement of corporate business objectives in the broadest sense. This would include an understanding of the role that databases play in managing information resources of the firm, and the role of new communication and collaboration technologies, such as wikis, blogs, and wireless and cellular computing.

- An in-depth understanding of how enterprise-wide information systems for production management, supplier management, sales force management, and customer relationship management are used to achieve efficient operations and help managers make better decisions for improving firm performance.

**Information Systems**

The information systems field is arguably one of the most fast changing and dynamic of all the business professions because information technologies are among the most important tools for achieving business firms’ key objectives. The explosive growth of business information systems has generated a growing demand for information systems employees and managers who work with other business professionals to design and develop new hardware and software systems to serve the needs of business. Of the 20 fastest-growing occupations through 2012, five are information systems occupations.

There are about 284,000 information system managers in the United States, with an estimated growth rate of 36 percent through 2012, expanding the number of new jobs by more than 100,000 new positions, with an additional 50,000 new hires required for replacements. As businesses and government agencies increasingly rely on the Internet for communication and computing resources, system and network security management positions are growing very rapidly.

**Outsourcing and Offshoring**

The Internet has created new opportunities for outsourcing many information systems jobs, along with many other service sector and manufacturing jobs. Offshore outsourcing to low-wage countries has been controversial because U.S. workers fear it will reduce demand for U.S. information systems employment. However, this fear is overblown given the huge demand for new information system hires in the United States through 2012. In fact, reducing the cost of providing information technology services to U.S. corporations by offshoring labor-intensive and lower-level jobs may increase the demand for U.S.-based information system workers as firms find the price of investing in information technology falls relative to other investments while its power to increase revenues and profits grows.

There are two kinds of outsourcing: outsourcing to domestic U.S. firms and offshore outsourcing to low-wage countries, such as India and eastern European countries. Even this distinction becomes problematic as domestic service providers, such as IBM, develop global outsourcing centers in India.

The impact of *domestic* outsourcing on the overall demand for information technology employment through 2012 is most likely quite small. Service provider firms, such as Hewlett-Packard and Accenture, add domestic IT employees as they expand their domestic IT services, while domestic information systems departments lose some employees or do not hire new employees.

The impact of *offshore* outsourcing on U.S. domestic IT jobs is more problematic because, ostensibly, jobs that move offshore decrease demand for workers in the United States. The most common and successful offshore outsourcing projects involve production programming and system maintenance programming work, along with call center work related to customer relationship management systems. Hence, the largest impact of offshore outsourcing will mostly likely be on technical positions in information systems and less on managerial positions.

Inflation in Indian wages for technology work, coupled with the additional management costs incurred in outsourcing projects, is leading to a counter movement of jobs back to the United States. Moreover, while technical IS jobs can be outsourced easily, all those management and organizational tasks required in systems development—including business process design, customer interface, and supply chain management—often remain in the
United States. The net result is that offshore outsourcing will increase demand in the United States for managerial IS positions, while negatively impacting lower-level technical jobs (Tam and Range, 2007; Lohr, 2007).

Given all these factors in the IT labor market, on what kinds of skills should information system majors focus? Following is a list of general skills we believe will optimize employment opportunities:

- An in-depth knowledge of how new and emerging hardware and software can be used by business firms to make them more efficient and effective, enhance customer and supplier intimacy, improve decision making, achieve competitive advantage, and ensure firm survival. This includes an in-depth understanding of databases, database design, implementation, and management.

- An ability to take a leadership role in the design and implementation of new information systems, work with other business professionals to ensure systems meet business objectives, and work with software packages providing new system solutions.

INFORMATION SYSTEMS AND YOUR CAREER: WRAP-UP

Looking back at the information system skills required for specific majors, there are some common themes that affect all business majors. Following is a list of these common requirements for information system skills and knowledge:

- All business students, regardless of major, should understand how information systems and technologies can help firms achieve business objectives such as achieving operational efficiency, developing new products and services, and maintaining customer intimacy.

- Perhaps the most dominant theme that pervades this review of necessary job skills is the central role of databases in a modern firm. Each of the careers we have just described relies heavily in practice on databases.

- With the pervasive growth in databases comes inevitably an exponential growth in digital information and a resulting challenge to managers trying to understand all this information. Regardless of major, business students need to develop skills in analysis of information and helping firms understand and make sense out of their environments.

- All business majors need to be able to work with specialists and system designers who build and implement information systems. This is necessary to ensure that the systems that are built actually service business purposes and provide the information and understanding required by managers and employees.

- Each of the business majors will be impacted by changes in the ethical, social, and legal environment of business. Business school students need to understand how information systems can be used to meet business requirements for reporting to government regulators and the public and how information systems impact the ethical issues in their fields.

HOW THIS BOOK PREPARES YOU FOR THE FUTURE

This book is explicitly designed to prepare you for your future business career. It provides you with the necessary knowledge and foundation concepts for understanding the role of information systems in business organizations. You will be able to use this knowledge to identify opportunities for increasing the effectiveness of your business. You will learn how to use information systems to improve operations, create new products and services, improve decision making, increase customer intimacy, and promote competitive advantage.

Equally important, this book develops your ability to use information systems to solve problems that you will encounter on the job. You will learn how to analyze and define a business problem and how to design an appropriate information system solution. You will deepen your critical-thinking and problem-solving skills. The following features of the text and the accompanying learning package reinforce this problem-solving and career orientation.
A Framework for Describing and Analyzing Information Systems
The text provides you with a framework for analyzing and solving problems by examining the people, organizational, and technology components of information systems. This framework is used repeatedly throughout the text to help you understand information systems in business and analyze information systems problems.

A Four-Step Model for Problem Solving
The text provides you with a four-step method for solving business problems, which we introduced in this chapter. You will learn how to identify a business problem, design alternative solutions, choose the correct solution, and implement the solution. You will be asked to use this problem-solving method to solve the case studies in each chapter. Chapter 11 will show you how to use this approach to design and build new information systems.

Hands-on MIS Projects for Stimulating Critical Thinking and Problem Solving
Each chapter concludes with a series of hands-on MIS projects to sharpen your critical-thinking and problem-solving skills. These projects include the Dirt Bikes USA running case, hands-on application software problems, and projects for building Internet skills. For each of these projects, we identify both the business skills and the software skills required for the solution.

Career Resources
To make sure you know how the text is directly useful in your future business career, we’ve added a full set of Career Resources to help you with career development and job hunting.

Heads Up
At the Beginning of each chapter is a Heads Up section showing exactly why you need to know about the contents of the chapter and how this knowledge will help you in your future career.

Digital Portfolio
The companion Web site includes a template for preparing a structured digital portfolio to demonstrate the business knowledge, application software skills, Internet skills, and analytical skills you have acquired in this course. You can include this portfolio in your resume or job applications. Your professors can also use the portfolio to assess the skills you have learned.

Career Resources Web Site
A Career Resources section on our companion Web site shows you how to integrate what you have learned in this course in your resume, cover letter, and job interview to improve your chances for success in the job market.

1.5 Hands-On MIS
The projects in this section give you hands-on experience in analyzing a real world company’s information systems needs and requirements based on an understanding of its business, using a database to improve management decision making, and using Internet software for job hunting.

UNDERSTANDING INFORMATION SYSTEM REQUIREMENTS
Software skills: Presentation software
Business skills: Management analysis and information system recommendations

How do you know what information systems are really needed by a business and which are the most important? How should a company’s structure or culture affect the building and use of information systems?
The Dirt Bikes case describes a real-world company that makes dirt bikes—a kind of motorcycle that is used off-road and often raced in competition. This case appears in every chapter with different assignments linked to the chapter contents. There is a complete description of the company, including its organizational structure, culture, management, and goals at the Laudon Web site for this text. The case contains spreadsheets and databases that complete the description of the company. The following is an illustration of the company’s organization chart, showing how the company is organized.

Dirt Bikes’s management has asked you to prepare a management analysis of the company to help it assess the firm’s current situation and future plans. Review Dirt Bikes’s company history, organization chart, products and services, and sales and marketing in the Introduction to Dirt Bikes. Then prepare a report that addresses these questions:

- What are the company’s goals and culture?
- What products and services does Dirt Bikes USA provide? How many types of products and services are available to customers? How does Dirt Bikes sell its products?
- How many employees are managers, production workers, or knowledge or information workers? Are there levels of management?
- What kinds of information systems and technologies would be the most important for a company such as Dirt Bikes?
- (Optional) Use electronic presentation software to summarize for management your analysis of Dirt Bikes.

**IMPROVING DECISION MAKING: USING DATABASES TO ANALYZE SALES TRENDS**

**Software skills:** Database querying and reporting  
**Business skills:** Sales trend analysis

You can find out how information systems improve management decision making in this exercise. Rather than guessing or relying on estimates and experience, managers today rely on information stored in databases. In this project, you will start out with raw transactional sales data and use Microsoft Access database software to develop queries and reports that help managers make better decisions about product pricing, sales promotions, and inventory replenishment. A part of the database is shown in the following figure.

On the Laudon Web site for Chapter 1, you can find a Store and Regional Sales Database developed in Microsoft Access. The database contains raw data on weekly store sales of computer equipment in various sales regions. You will use Access to manage the data and turn them into useful business information.
The database includes fields for store identification number, sales region number, item number, item description, unit price, units sold, and the weekly sales period when the sales were made.

Develop some reports and queries to make this information more useful for running the business. Sales and production managers want answers to the following questions:

- Which products should be restocked?
- Which stores and sales regions would benefit from a promotional campaign and additional marketing?
- When (what time of year) should products be offered at full price, and when should discounts be used?

You can easily modify the database table to find and report your answers. Print your reports and results of queries.

**IMPROVING DECISION MAKING: USING THE INTERNET TO LOCATE JOBS REQUIRING INFORMATION SYSTEMS KNOWLEDGE**

Software skills: Internet-based software
Business skills: Job searching

Visit job-posting Web sites such as Monster.com or hotjobs.com. Spend some time at the sites examining jobs for accounting, finance, sales, marketing, and human resources. Find two or three descriptions of jobs that require some information systems knowledge. What information systems knowledge do these jobs require? What do you need to do to prepare for these jobs? Write a one- to two-page report summarizing your findings.

**LEARNING TRACKS**

The following Learning Tracks provide content relevant to topics covered in this chapter:

1. How Much Does IT Matter?
2. Changing Business Environment for Information Technology
3. Business Information Value Chain
Review Summary

1 How are information systems transforming business and what is their relationship to globalization? E-mail, online conferencing, and cell phones have become essential tools for conducting business. Information systems are the foundation of fast-paced supply chains. The Internet allows businesses to buy, sell, advertise, and solicit customer feedback online. The Internet has stimulated globalization by dramatically reducing the costs of producing, buying, and selling goods on a global scale.

2 Why are information systems so essential for running and managing a business today? Information systems are a foundation for conducting business today. In many industries, survival and even existence is difficult without extensive use of information technology. Businesses today use information systems to achieve six major objectives: operational excellence; new products, services, and business models; customer/supplier intimacy; improved decision making; competitive advantage; and day-to-day survival.

3 What exactly is an information system? How does it work? What are its people, organization, and technology components? From a technical perspective, an information system collects, stores, and disseminates information from an organization’s environment and internal operations to support organizational functions and decision making, communication, coordination, control, analysis, and visualization. Information systems transform raw data into useful information through three basic activities: input, processing, and output. From a business perspective, an information system provides a solution to a problem or challenge facing a firm and represents a combination of people, organization, and technology elements.

The people dimension of information systems involves issues such as training, job attitudes, and management behavior. The technology dimension consists of computer hardware, software, data management technology, and networking/telecommunications technology, including the Internet. The organization dimension of information systems involves issues such as the organization’s hierarchy, functional specialties, business processes, culture, and political interest groups.

4 How will a four-step method for business problem solving help you solve information system-related problems? Problem identification involves understanding what kind of problem is being presented and identifying people, organizational, and technology factors. Solution design involves designing several alternative solutions to the problem that has been identified. Choice entails selecting the best solution, taking into account its cost and the available resources and skills in the business. Implementation of an information system solution entails purchasing or building hardware and software, testing the software, providing employees with training and documentation, managing change as the system is introduced into the organization, and measuring the outcome. Problem solving requires critical thinking in which one suspends judgment to consider multiple perspectives and alternatives.

5 How will information systems affect business careers and what information system skills and knowledge are essential? Business careers in accounting, finance, marketing, operations management, management and human resources, and information systems all will need an understanding of how information systems help firms achieve major business objectives; an appreciation of the central role of databases; skills in information analysis and business intelligence; sensitivity to the ethical, social, and legal issues raised by systems; and the ability to work with technology specialists and other business professionals in designing and building systems.
Key Terms

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Review Questions

1. How are information systems transforming business and what is their relationship to globalization?
   - Describe how information systems have changed the way businesses operate and their products and services.
   - Describe the challenges and opportunities of globalization in a “flattened” world.

2. Why are information systems so essential for running and managing a business today?
   - List and describe the six reasons why information systems are so important for business today.

3. What exactly is an information system? How does it work? What are its people, organization, and technology components?
   - List and describe the organizational, people, and technology dimensions of information systems.
   - Define an information system and describe the activities it performs.
   - Distinguish between data and information and between information systems literacy and computer literacy.
   - Explain how the Internet and the World Wide Web are related to the other technology components of information systems.

4. How will a four-step method for business problem solving help you solve information system-related problems?
   - List and describe each of the four steps for solving business problems.
   - Give some examples of people, organizational, and technology problems found in businesses.
   - Describe the relationship of critical thinking to problem solving.
   - Describe the role of information systems in business problem solving.

5. How will information systems affect business careers and what information system skills and knowledge are essential?
   - Describe the role of information systems in careers in accounting, finance, marketing, management, and operations management and explain how careers in information systems have been affected by new technologies and outsourcing.
   - List and describe the information system skills and knowledge that are essential for all business careers.
Discussion Questions

1. What are the implications of globalization when you have to look for a job? What can you do to prepare yourself for competing in a globalized business environment? How would knowledge of information systems help you compete?

2. If you were setting up the Web sites for NBA teams, what people, organization, and technology issues might you encounter?

Video Case

You will find a video case illustrating some of the concepts in this chapter on the Laudon Web site along with questions to help you analyze the case.

Teamwork

Analyzing a Business System

In a group with three or four classmates, find a description in a computer or business magazine of an information system used by an organization. Look for information about the company on the Web to gain further insight into the company, and prepare a brief description of the business. Describe the system you have selected in terms of its inputs, processes, and outputs and in terms of its organization, people, and technology features and the importance of the system to the company. If possible, use electronic presentation software to present your analysis to the class.

BUSINESS PROBLEM-SOLVING CASE

Is Second Life Ready for Business?

Second Life is a 3D virtual online world created by former RealNetworks CTO Philip Rosedale through Linden Lab, a company he founded in San Francisco in 1999. The world is built and owned by its users, who are called residents. Nearly 7 million people have signed up to be residents of Second Life’s world, also known as the Grid. In May 2007, the usage stats on Second Life’s Web site (www.secondlife.com) showed that just over 1.7 million residents had logged in over the previous 60 days. Second Life runs over the Internet using special software, called the Viewer, that users download to their desktops.

Second Life is not a game. Residents interact with each other in a 3-D social network. They can explore, socialize, collaborate, create, participate in activities, and purchase goods and services. The Second Life Web site says that its world is similar to a massively multiplayer online role playing game (MMORPG) but distinct in that it allows nearly unlimited creativity and ownership over user-created content. When logged in, residents take on a digital persona, called an avatar. Each user may customize his or her own avatar, changing its appearance, its clothing, and even its form from human to humanoid or something altogether different.

Second Life has its own virtual economy and currency. The currency is the Linden Dollar, or Linden for short, and is expressed as L$. There is an open market for goods and services created on the Grid. Residents may acquire Lindens this way, or by using currency exchanges to trade real-world money for Lindens. The Linden has a real-world value, which is set by market pricing and tracked and traded on a proprietary market called the LindeX. A very modest percentage of residents earns a significant profit from dealing in the Second Life economy. One user, known on the Grid as Anshe Chung, has accumulated enough virtual real
estate that she could sell it for an amount of Lindens equaling US$1 million. More common are the residents who gross enough to cover the expense of their participation in the grid. According to statistics from Second Life, 304,499 residents spent money on the Grid during August 2007.

Basic membership in Second Life is free and includes most of the privileges of paid membership, except the right to own land. Residents with Premium memberships are eligible to own land on the Grid. The largest lots, or Entire Regions, measure 65,536 square meters (about 16 acres) and incur a monthly land use fee of US$195. Second Life also offers private islands, which are the same size as Entire Regions but require a one-time fee of US$1,675 plus monthly maintenance fees of US$295.

Residents create content for the Grid using tools provided by Second Life. For example, the software includes a 3-D modeling tool that enables users to construct buildings, landscapes, vehicles, furniture, and any other goods they can imagine. A standard library of animations and sounds enables residents to make gestures to one another. Basic communication is performed by typing in the manner of an instant message or chat session.

Users may also design and upload their own sounds, graphics, and animations to Second Life. Second Life has its own scripting language, Linden Scripting Language, which makes it possible for users to enhance objects in the virtual world with behaviors.

Although the concept of a 3-D virtual world is in its infancy, this has not stopped businesses, universities, and even governments from jumping into the fray to see what a virtual world has to offer them. The hope is that Second Life will be a birthing ground for new industries and transform business, commerce, marketing, and learning the same way that the Web did in the late twentieth and early twenty-first centuries.

The advertising and media industries have been early proponents of the technology, opening virtual offices to facilitate internal communications and to position themselves at the forefront of the digital landscape in order to recruit tech-savvy employees.

Crayon is a new-media marketing firm that has purchased an island on the Grid, named crayonville, to serve as its primary office. With employees scattered in real-world offices on both sides of the Atlantic, crayonville provides the firm with a new way to bring everyone together, even if the employees are represented by avatars. Crayon leaves its conference room open to the public unless matters of client confidentiality come into play. Employees communicate by text message and with Skype Internet telephony. The company is still evaluating the use of Second Life for client meetings.

A Second Life presence may convince potential clients that an advertising agency is on the cutting edge of technology, and therefore able to market to consumers who are there as well. Leo Burnett, an ad agency with 2,400 employees, built an Ideas Hub on the Grid with the goal of bringing workers together to mingle and exchange ideas in a “creative lounge” environment. The company also plans to hold functions in its virtual space that were traditionally hosted in real-world spaces. Industry executives put the price tag of a Second Life business presence at $20,000.

Television and media companies are starting to use Second Life to attract viewers who have forsaken television for the Internet or to offer existing viewers a new medium for interacting with their brands. For example, visitors to the Second Life island for Major League Baseball (MLB) can mingle during the All-Star Game and watch the Home Run Derby. The average time they stayed was two hours, compared to 19 minutes at the MLB Web site.

What about Second Life would encourage companies like IBM to invest $10 million in exploring the possibilities of virtual business? For one, it can offer the following to support important business functions like customer service, product development, training, and marketing: a three-dimensional space in which a user can interact with visual and auditory content; custom content that can be altered and animated; a persistent presence that remains intact for future work even when users log off; and a community where like-minded people can gather to pursue activities of mutual interest.

IBM employees use their avatars to attend meetings in virtual meeting rooms where they can see PowerPoint slides while reading the text of a meeting or lecture or listen to it via a conference call. Virtual attendees can use instant messaging to send questions and receive answers from other avatars or the lecturer. Lynne Hamilton, who runs professional development classes for IBM’s human resources (HR) department, uses Second Life for orienting new employees located in China and Brazil. An HR avatar will give a talk and then respond to text questions from the new employees.

Retailers such as Reebok, Adidas, American Apparel, and 1-800-Flowers.com have set up stores in Second Life, hoping that users will steer their avatars their way and buy goods to deliver to their real-world addresses. Some of these Second Life stores have links to the retailers’ real-world Web sites where visitors can purchase actual physical goods. So far, these Second Life retailers’ expectations are low, but they believe their virtual presence could enhance their brand image and provide new insights into how people might act in the online realm.

American Apparel initially set up its virtual store to test sales of virtual clothing to residents for their avatars. Feedback from consumers and observers quickly convinced American Apparel to link its virtual store with...
its real-world business. Customers who bought virtual clothing received discounts on American Apparel clothing purchases in the real world.

IBM researchers set up retail kiosks on the Grid that enable residents to shop for real-world Amazon.com products while the residents are in-world. Amazon cooperates by making the tools to develop in-world applications available.

Sears, Adidas, Dell, Circuit City, and Toyota have also developed Second Life identities. However, as of the writing of this case, their virtual stores are mostly empty. None of the major companies has bothered to provide “staff” for its virtual space. The social aspect of the shopping experience is not present. American Apparel recently closed its virtual clothing shop.

While it is too soon for companies to measure the return on their investment in Second Life, some have instantly recognized the value of user-created content, user investment, user input, and the cost-savings of leveraging all for new business opportunities. Prototyping in a virtual world is fast and cheap. Crescendo Design, a residential designer in Wisconsin, uses Second Life’s 3-D modeling tools to give clients an inside view of their homes before they are constructed. Clients can suggest changes that would not be obvious from working from traditional blueprints, and the designer avoids mistakes that would be expensive to fix if made in the real world.

Institutions of higher education have purchased their own islands to create campuses where students and faculty can meet for real-time classwork or to hold informal discussions related to their classes. Second Life is a particular boon to distance learning. Insead, an international business school with real-world classes in France and Singapore, is building a virtual campus with rooms for virtual classroom lectures, research laboratories, and lounge areas for students to meet with professors, potential employers, and fellow classmates. Insead’s Second Life presence will help it reduce travel and physical building expenses while bringing together students and professors from across the globe. Eventually students will be able to download documents, work in teams, and meet alumni online.

A number of companies, including Hewlett-Packard and global management consultancy Bain and Company, are experimenting with Second Life for screening prospective hires. Job seekers create an avatar representing themselves and communicate with executives of prospective employers by exchanging instant-message-like text messages. Some interviewees and employers report having trouble designing and controlling the movements of their avatars, and companies still need to interview their final selections face to face. But participating companies have found Second Life useful for narrowing the pool of candidates and trimming recruitment expenses.

From a popularity standpoint, Second Life is far behind social networks such as MySpace, which has 180 million users. MySpace and the soaring video-sharing site YouTube are both accessible through a familiar Web browser and do not require any additional software.

A user who is willing to take the steps necessary to download and install the Second Life Viewer may find that his or her computer does not meet Second Life’s minimum or recommended system requirements. This last factor is especially important for businesses who may need to reconfigure the systems of a large number of employees in order to get them on the Grid.

Still, support for Second Life continues to mount in many forms. Reuters, the global news service, has assigned a full-time reporter to the Grid. In-world, reporter Adam Pasick goes by the avatar Adam Reuters. He files real-world stories about virtual-world happenings. eBay has decided to permit auctions of virtual goods from Second Life despite previously banning items from other virtual worlds and online games.


Case Study Questions

1. What problems can Second Life help businesses solve?
2. Considering what you have learned about Second Life, how could you, as an individual, create a modest start-up business on the Grid? What goods would you sell? Why would this be a good choice of product? What, in simple terms, would your business plan be? Why would it work?
3. Visit eBay on the Web and see what Second Life items you can find listed for auction. How would you rate the activity surrounding these items? Are you surprised by what you see? Why or why not?
4. How important is interoperability between 3-D worlds such as Second Life and other Web sites such as Amazon, MySpace, and YouTube? Do you think that Second Life can survive and prosper on its own? What is the future of these entities? Separate or integrated?
5. What obstacles does Second Life have to overcome in order to become a mainstream business tool? Does it face fewer or more obstacles to become a...
mainstream educational tool? To what do you attribute the difference?

6. What kinds of businesses are most likely to benefit from a presence on Second Life? Why?

7. Would you like to interview for a job using Second Life? Why or why not?

8. Is Second Life a precursor of how business will be conducted in the future or a corporate experiment? Justify your answer.