

# Business and Technology



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**11-1** Computer Systems

**11-2** Business Applications of Technology

**11-3** Other Technology Issues

# Planning a Career in ...

## INFORMATION TECHNOLOGY



- 1 Almost every job in business is touched by technology. Technology supports core business functions such as communication through phones and e-mail, information storage and processing by computers, and reporting through printing, presentations, and conferencing.

Information technology workers use a variety of skills and educational backgrounds to help businesses function. These skills can be used to support hardware, such as computer or communication networks. Technology workers can also support software usage by installing, programming, or training others to use computer programs.

### Related Job Titles

- Information Systems Manager
- Computer Programmer
- Software Engineer
- Computer Support Specialist
- Network Administrator
- Systems Analyst
- Computer Scientist
- Database Administrator

Most high schools offer a number of computer classes. Instruction is also available at computer training centers. Some employers will pay for employees to take computer courses. Self-paced and online programs are also available. Information technology training may be achieved through a specialized vocational program or a college degree program. Knowledge of computer systems, computer languages, application software, and other technology is required for specialized positions.

### Analyze Career Opportunities in ...

## INFORMATION TECHNOLOGY

Use library and Internet resources to learn more about careers in information technology. Choose one of the job titles listed in the box above and answer the following questions.

1. Identify the minimum educational requirements for job. Explain other training or education that might be needed for advancement.
2. Is this a career that interests you? Describe a few things you could do to learn more about this career.

### *What's it like to work as a ... Web Developer?*

"Should we use a Flash intro? Will a banner heading be most appropriate? What functions are required to serve the needs of this new customer?" Kellye, a web developer, is in a morning brainstorming session with her team. The team plans to have some ideas ready in time for a meeting with the customer tomorrow.

Around the world, more than a billion people access the Internet for information, entertainment, and business activities. Websites are the basic element of the Internet. Web developers analyze, plan, design, implement, and support the websites of their organizations. Many businesses use outside vendors like Kellye's company to create and maintain their websites.

Knowledge of multimedia software is a key requirement for web developers. Graphics, digital imagery, audio, and video are vital to the appeal and effectiveness of a website. Web developers are often involved with creating websites for online selling and other e-commerce activities.

**What about you?** In what ways do you use computers and technology each day that might be the basis for a future career?

# 11-1 Computer Systems



## Goals

- 1 Identify the main elements of a computer system.
- 2 Describe input devices and processing activities.
- 3 Explain computer storage media and output types.

## Key Terms

computer system 263  
hardware 263  
software 263  
computer network 263  
central processing unit (CPU) 265  
program 265  
computer language 265  
operating system software 265  
application software 265

## Focus on REAL LIFE

Ms. Jenkins announced to her class, "The French Club will meet today during sixth period. The topic for discussion will be computers and new technology."

Fran looked at Brenda and said, "That doesn't make sense! What do computers have to do with the French Club?"

"Recently our club decided to use a database program to keep track of our membership records," said Brenda. "In addition," she went on, "the club is using e-mail to talk to students in France. Then, we are planning a videoconference with other French clubs around the United States. We will also use our computer network to..."

"Wait a minute!" Fran exclaimed. "OK. OK. Computers do have a lot to do with the French Club."

"Well then, I guess you'll be coming to the meeting today after school," responded Brenda.

### Goal 1

Identify the main elements of a computer system.

## 2 COMPUTERS IN SOCIETY

Computers are everywhere. These electronic devices process store receipts, test scores, and sports statistics. Computers in business are used to store, process, and report information. Computers are also used to design factories, control traffic patterns, and measure medical test results.

- 3 Nearly every business uses some type of computer. A company needs quick, efficient processing to control its operating costs, manage resources, and stay competitive. When you think about the billions of business transactions, checks, and school records that are processed each day, you realize the importance of computers.

- 4 Each day in banks, stores, offices, factories, homes, and nonprofit organizations, the use of computer systems is expanding. As managers plan and implement computerized activities, they must decide how best to use technology to serve the production and distribution needs of the organization.



How have computers changed records management in business?

## 5 Elements of a Computer System

Video games, smart phones, and automated highway toll collection systems all have four basic components:

1. Input device
2. Processing unit
3. Memory and storage
4. Output device

6 As shown in Figure 11-1, these four basic components make up what is called a **computer system**. The physical elements of a computer system are called the **hardware**. Examples of computer hardware include keyboards, cameras, microphones, speakers, **monitors** (or screens), chips, and printers.

7 Hardware is constantly changing and expanding. For example, today most computers can handle sound, graphics, animation, and video. These features are being offered on smaller and more compact computers as well as other devices. Most smart phones offer some computer functions.

8 In contrast to hardware, **software** refers to the instructions that run the computer system. Businesses commonly use several types of software. These include word

processing, spreadsheet, database, presentation, and communications programs.

## 9 Computer Networks

Computers in businesses and schools are commonly linked together in a **computer network**. Organizations link computers together so users can share hardware, software, and data.

10 The Internet is the largest and best-known computer network in the world. The Internet is most often used for two activities: exchanging e-mail and accessing the World Wide Web.

11 The World Wide Web (WWW) is also called the Web. It allows computer users to access information on almost every topic. The Web uses text, images, hyperlinks, graphics, frames, animation, video, and audio. It is an extensive information source. This global computer



Do you believe that you are *computer literate*—able to understand and use computers efficiently? Are you comfortable using computers? Describe how the computerization of our society and economy may affect your ability to achieve your life-span goals.

### Computer System



► **Figure 11-1**

Which components of a computer system are represented in this illustration?



Digital Vision/Getty Images

What do you think the next input device invented for use with a computer will be?

## Goal 2

Describe input devices and processing activities.

network provides access to information, facilitates e-commerce, and allows millions of people around the world to make connections. The World Wide Web is also an important source for handling business transactions.

- 12 A local computer network, sometimes called an *intranet*, is an organization's private computer network. It is based on the same communication standards as the Internet. An intranet is a smaller version of the Internet. Only members or employees can utilize an intranet. An intranet's website looks and functions just like a typical website, but it is private and only accessible to authorized users.

- 13 Like the Internet, an intranet is primarily used to share information. An intranet is an effective tool for saving time and money for companies. It can bring many benefits to an organization.

### checkpoint ✓

List the four main elements of a computer system.

## 14 INPUT AND PROCESSING

Computer systems start with the entering of data or other input items. Operation of the system continues with the processing of the data.

### 15 Input: Getting Started

The first major component of a computer system is known as *input*. While people are mostly concerned with the results of computer operations, there has to be a starting point. Data is entered into a computer system with an input device.

- 16 The keyboard is a common input device. Keyboards are generally used to enter text and numbers. Another common input device is the mouse, a hand-controlled device used to point to commands or images on the computer screen.

- 17 Other input devices are often used for specific activities. The following list includes some common examples.

- Touchpads built into laptop computers allow the user to point and click just as you would with a mouse.

- Controllers and joysticks for video games allow players to direct the actions of game characters.
- Touch-sensitive screens allow users to use finger contact to enter data, give commands, and make selections.
- Laser devices use light to read bar codes to track sales, inventory, and shipping.
- Webcams allow for video conferencing anywhere in the world.
- Scanners translate words and images into computer-readable formats.
- Voice-activated systems allow words spoken into a microphone to be entered as data or to be translated into instructions or commands.
- Microphones and cameras allow input of audio and video.

## 18 Processing: Making Things Happen

How does data become meaningful information to be used by organizations and individuals? *Processing* is the second major component of a computer system. This activity takes place in the **central processing unit (CPU)**, which is the control center of the computer.

19 The CPU is the “brain” of a computer system. In a personal computer, the CPU consists of tiny wafers or chips. These chips carry instructions and data using electronic pulses.

20 The most common way to give instructions to a computer is with a program. A **program** is a series of detailed, step-by-step instructions that tell the computer what functions to complete.

21 Most powerful computer programs are in formats that are difficult to understand. The format of a computer program is a computer language. A **computer language** is a system of letters, words, numbers, and symbols used to communicate with a computer.

**fyi**

Biometric input devices are used to recognize fingerprints, facial features, voices, and eye patterns. These personal characteristics are scanned and processed to allow access to buildings, offices, and other secured areas. They are also used to authorize access to computers, files, and specific transactions, including purchases.



Joel Calheiros/Shutterstock.com

22 The two main types of computer programs are operating system software and application software. **Operating system software** translates commands and allows application programs to interact with the computer’s hardware. The most commonly used operating system is Windows®. **Application software** refers to programs that perform specific tasks such as word processing, database management, or accounting. Commonly used application software includes word processing, desktop publishing, database, spreadsheet, and presentation software.

23 **Word Processing** An organization’s reports, correspondence, and other information are created with word processing software. This type of program allows the



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What types of computer application software have you found most useful in your daily life?

user to enter, store, revise, and print text for letters, memos, reports, or standard business forms.

- 24 **Desktop Publishing** Word processing activities may be expanded to produce newsletters, brochures, and other publications. Desktop publishing usually includes graphics software to prepare charts, graphs, and other visual elements. Today, computer graphics are commonly used in television commercials, movies, training materials, and in other settings with a need for visuals.
- 25 **Database Software** "Create a list of employees who speak a language used in Asia." This type of request would involve the use of *database software*. A database is an organized collection of information with data items related to one another in some way.
- 26 In recent years, *database marketing* has become popular. Software is used to maintain, analyze, and combine customer information files. The

information about customers is then used to increase sales by better serving customer needs. For example, a household with young children might receive advertising about educational software. Using a database increases the chance of reaching potential customers who are likely to buy the product.

- 27 **Spreadsheet** In the past, accountants used worksheet paper with many rows and columns. Such a worksheet is an example of a manually prepared spreadsheet. *Spreadsheet software* is a program that formats data in columns and rows in order to do calculations.
- 28 The location where a column and row intersect is called a *cell*. A spreadsheet is created with specific information, words, numbers, or formulas entered into the cells. Spreadsheets are used to prepare payroll records, financial statements, budgets, and other financial documents. An example of a spreadsheet screen appears in Figure 11-2.

► **Figure 11-2**

How can spreadsheet software improve accuracy?

	A	B	C	D	E	F	G	H	I	J	K	L
1							<b>PROFIT &amp; LOSS - ACTUAL VS. BUDGET</b>					
2												
3							<b>Actual</b>		<b>Budget</b>		<b>\$ Over/(Under) Budget</b>	
4												
5						Income						
6						Product Sales	432,144		450,000		(17,856)	
7						Service Sales	471,866		500,000		(28,134)	
8						Total Income	904,010		950,000		(45,990)	
9						Cost of Goods Sold						
10						Payroll-Direct Labor	186,433		200,000		(13,567)	
11						Subcontractors	201,074		172,500		28,574	
12						Other Cost of Goods Sold	34,975		42,500		(7,525)	
13						Total Cost of Goods Sold	422,482		415,000		7,482	
14						Gross Profit	481,528		535,000		(53,472)	
15						Overhead Expenses						
16						Advertising	742		500		242	
17						Bad Debt	1,050		0		1,050	
18						Depreciation	17,433		17,500		(67)	
19						Employee Benefits	32,876		35,000		(2,124)	
20						Insurance	32,777		33,500		(723)	
21						Office Expenses	2,192		2,000		192	
22						Payroll-Administrative	153,044		175,000		(21,956)	
23						Professional Fees	12,125		11,750		375	
24						Rent	67,200		67,200		0	
25						Taxes-Business	16,433		17,000		(567)	
26						Taxes-Payroll	34,362		38,000		(3,638)	
27						Travel Expenses	15,273		12,200		3,073	
28						Utilities	8,924		9,475		(551)	
29						Total Expenses	394,431		419,125		(24,694)	
30												

29 Spreadsheet software may also be used to do a *what-if* analysis of a situation. For example, a manager may want to see the effect of different prices on profit. The spreadsheet automatically recalculates for each price.

30 **Presentation Software** Creating slide shows for educational and business seminars has become very common. The use of *presentation software* allows a speaker to show text, data, photos, and other visuals. These images may be accompanied by sound effects, music, or other audio. The use of multimedia elements adds to the value and enjoyment of presentations.

### checkpoint ✓

What are common input devices?

## 31 MEMORY AND OUTPUT

Various programs must be stored for use in the computer system. Memory is also used for data processing activities.

### 32 Memory and Storage: Saving for Later

The third major component of a computer system is the *memory*. When in use, a program is stored in the computer's memory. This memory within the computer is also called *internal* (or *primary*) *storage*. During processing, both the program and any data entered with an input device are stored in memory.

33 As shown in Figure 11-3 memory capacity is measured using units such as *bit*, *nibble*, *byte*, and *kilobyte* (*K*). To give you an idea of a computer's internal storage capacity, it would take at least a 1K computer to store the information on an average page in this book.

34 Primary storage cannot hold all of the programs and all of the data needed by

### WORK as a TEAM

Your school experiences are continually changing because of technology. Create a list of ways in which you have used computers and other technology in school settings and when doing homework. Discuss ways in which technology might be used to enhance the school learning environment.

computer users. Therefore, *external* (or *auxiliary*) *storage* that is not part of memory is available for storing both programs and data.

35 A hard disk is housed inside the computer allowing storage of billions of characters. CDs, DVDs, magnetic tapes, memory cards, and flash memory sticks are examples of commonly used auxiliary storage devices.

### 36 Output: Obtaining Results

The final component of a computer system is known as *output*. This element is of greatest interest to most people. Your score on a video game, the results of a test, or the sales for a new product are important outcomes of data processing activities.

### Goal 3

Explain computer storage media and output types.

#### MEMORY CAPACITY

Bit	smallest unit
Nibble	4 bits; a ½ byte
Byte	8 bits
Kilobyte	1,024 bytes
Megabyte	a million bytes
Gigabyte	a billion bytes
Terabyte	a thousand gigabytes

► **Figure 11-3**

Why is it important to know the number of bytes of memory capacity in a computer? How many kilobytes of memory are in a computer with 3 gigabytes of memory?



What types of data output do you expect to see on a company website? What types of data output are used routinely in the workplace? Give some examples.

- 38 Output devices present data in a form that can be retrieved later or may be communicated immediately. There are four common types of output:

- 39
1. Text output, which includes processing results displayed on a computer screen (monitor) or in a printed report
  2. Graphics output, which might include company logos, photos, drawings, scrolling messages, and animated graphics
  3. Audio output, which involves music and broadcast clips as well as presentations for training seminars
  4. Video output, which may be in the form of a training film, television commercial, or news report

Quite often, a single output source, such as a website, includes more than one of these categories.

### checkpoint ✓

How do internal and external memory differ?

## 11-1 Assessment

40

### Key Concepts

Determine the best answer.

1. An optical scanner is a device in the \_?\_ component of a computer system.
  - a. input
  - b. output
  - c. memory
  - d. processing
2. A list of potential customers for your new product would be created using \_?\_ software.
  - a. desktop publishing
  - b. word processing
  - c. spreadsheet
  - d. database

3. Which of the following is an example of auxiliary storage?
  - a. CPU
  - b. DVD
  - c. monitor
  - d. software

### Make Academic Connections

4. **Technology** Prepare a visual presentation of a computer system and explain how each part works in the system.
5. **Economics** Describe how technology might affect the operating costs and profits of a company. What are possible effects of technology on the wages of workers?

Study Tools



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Protected by deserts on both sides, Egypt has a tradition of architecture and culture. Today, the country is dependent on the fertile land along the Nile River. Cotton, fruits, and vegetables are some of the country's main exports. The Suez Canal provides a vital trade route between the Atlantic Ocean and the Indian Ocean.

As you enter a meeting in Egypt, several greetings may be used. The handshake is most common. Expect to see some traditional clothing, but foreign businesspeople should wear business suits. Clothing styles should always be modest and conservative. Even though it can be extremely hot, most of the body must remain covered. Even shirt collars are expected to be buttoned. You may be expected to take off your shoes, but only after following the lead of your host.

The workweek in Egypt runs from Saturday to Wednesday. Friday is the Muslim holy day, and most people also take off Thursday. In your negotiations, the pace will start slowly. Do not rush the situation. Because Egyptians must get to know you and like you before doing business, the decision process will take time. Also, be ready to compromise in your negotiations.

While the main language of Egypt is Arabic, many business discussions may be carried out in English or French. Business cards will be better received if one side is English and the other side is Arabic. Language meaning will not always be direct. A "yes" may in fact mean "possibly."

Be cautious of body language. The left hand is considered unclean in the Arab world. Always use your right hand unless both are needed, such as for lifting a heavy object. While Egyptians may gesture with their hands when speaking, pointing is considered very rude. The "thumbs up" sign is offensive.

Your conversations may include talk of soccer, basketball, and boxing. Avoid talking about political issues. In regard to food, many of the most popular Egyptian recipes are thousands of years old. Wheat and barley are the basis for many breads, pastries, and cakes. Peas, beans, lettuce, cucumbers, leeks, and other vegetables are often served with oil and vinegar dressing. Figs, dates, pomegranates, and grapes are important parts of the Egyptian diet, as are fish, poultry, lamb, and beef.

## Think Critically

1. How does doing business in Egypt differ from business activities with which you are familiar?
2. What common mistakes might a person make when doing business in Egypt?
3. Conduct library or Internet research to find additional information about business and economic activities in Egypt.

How do climate and geography impact doing business in Egypt?



# 11-2 Business Applications of Technology



## Goals

- 1 Describe the components of a management information system (MIS).
- 2 Identify computer applications in service industries.
- 3 Discuss e-commerce activities.

## Key Terms

- management information system (MIS) 270
- computer-assisted instruction (CAI) 272
- e-commerce 274

## Focus on REAL LIFE

Josh Aki arrived on the first day of his new part-time job at NBI Distributors. This retailing company sells an array of products by mail, telephone orders, and via the Internet.

During orientation, Josh met the sales manager and learned that some of the firm's products were doing well and others were just sitting in the warehouse. After he got settled at his desk, Josh's supervisor said, "Josh, please outline a report with the sales results of the new products we have introduced over the past six months. Alicia will help you get started."

After some initial pleasantries, Alicia showed Josh how to check the database for sales results. She suggested that he summarize the data on the spreadsheet program and prepare his report with word processing software.

"Thanks, will you be around if I need more help?" Josh asked. Alicia smiled and said, "Sure, Josh. Welcome to the NBI team."

### Goal 1

Describe the components of a management information system (MIS).

## 42 MANAGEMENT INFORMATION SYSTEMS

Managers need information to make business decisions. A **management information system (MIS)** is a coordinated system of processing and

reporting information in an organization. Computer systems and software are essential parts of management information systems.

- 43 A company may need a departmental budget that provides information on expected income and expenses for the next three months. Using an accounting program, past company data and future projections can be processed to create this budget. Budgets help with day-to-day decisions and planning for the future.

### 44 Components of an MIS

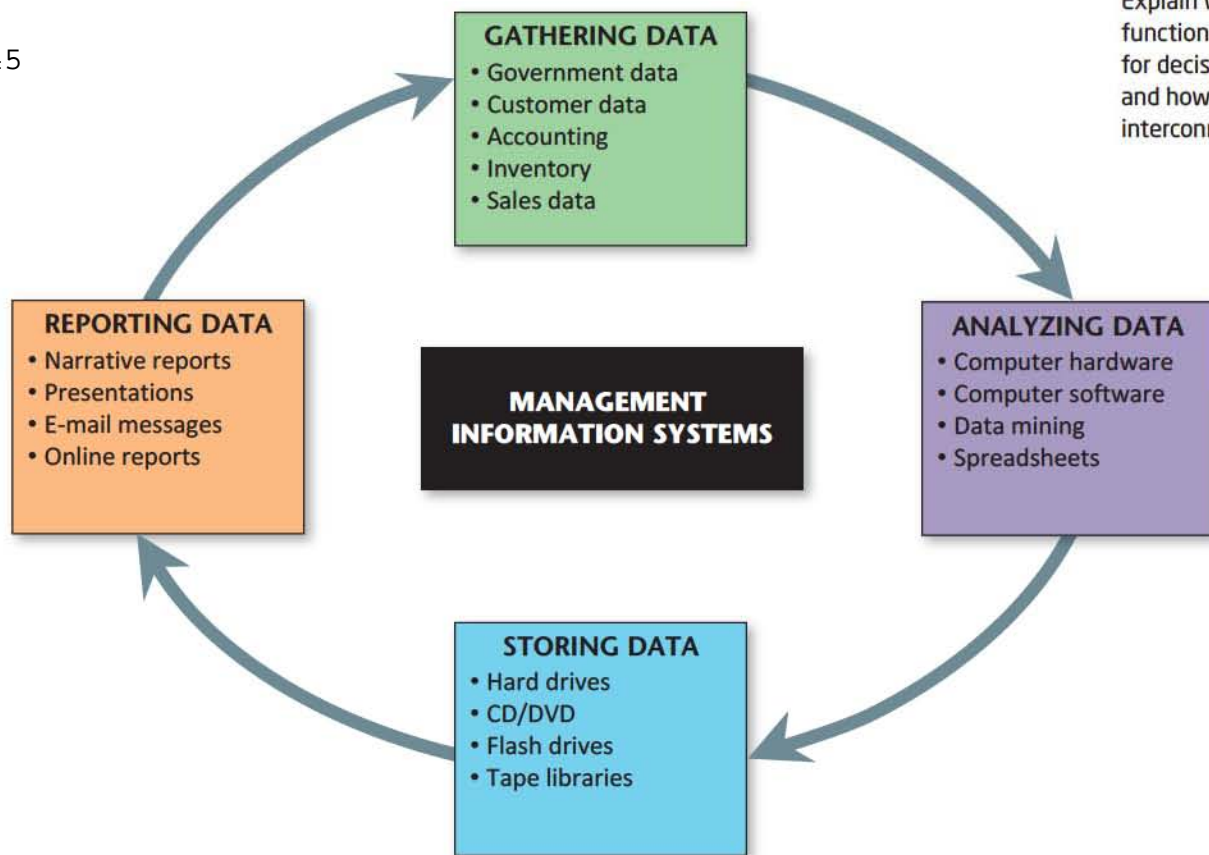
As shown in Figure 11-4 on the next page, the four main components of an MIS are gathering data, analyzing data, storing data, and reporting results. These activities allow an organization to obtain needed information in four main categories—financial, production and inventory, marketing and sales, and human resources.



Why are computer systems and software essential parts of an MIS?

## Main Components of Management Information Systems

45



► **Figure 11-4**

Explain why these functions are important for decision making and how they are interconnected.

- 46
1. *Financial information*, including budgets, sales reports, and financial statements
  2. *Production and inventory information*, including production summaries, lists of tools and supplies, and finished goods reports
  3. *Marketing and sales information*, including data on customer needs, current economic conditions, and actions of competitors
  4. *Human resources information*, including salaries, employee benefit data, and employee evaluations

### 47 Data Sources

The information for an MIS comes from several sources. *External* data sources are outside an organization. Financial institutions, government agencies, and customers are examples of external data sources.

48 In contrast, *internal* data sources provide input from within the

organization. Internal data includes accounting records, inventory information, and company sales figures. While gathering raw data may be an easy task, changing these facts and figures into meaningful information is the major goal of an MIS.

### 49 The MIS in Action

What activities are involved in a management information system? How is needed information communicated to managers? The operation of the MIS involves the following steps:

1. Identify the information needs of the organization.
2. Obtain facts, figures, and other data.
3. Process, analyze, and organize data in a useful manner.
4. Distribute information reports to those who make decisions.
5. Update data files as needed.

## WORK as a TEAM

Websites for international business must be adapted to cultural factors in other countries. Design a website for doing business in another country. Consider the language, format, design, colors, graphics, and other factors.

- 50 Computer networks are often used in an MIS to distribute information to managers, employees, and others. These networks connect computers, printers, and other equipment within a company or around the world.
- 51 Worldwide networks are set up through telephone lines, satellites, and other communication technology. Also important for communicating information is e-mail. E-mail gives users the ability to send data quickly through a computer system. After an employee prepares a letter or report, the document is sent electronically to another computer on the local or worldwide network.

### checkpoint ✓

What are the four components of a management information system?

### Goal 2

Identify computer applications in service industries.

## 52 TECHNOLOGY IN SERVICE INDUSTRIES

More than 60 percent of workers in the United States are employed in service industries. The use of computers in these organizations is extensive.

### 53 Public Service

Government agencies use computers to keep records. For example, the federal government keeps social security records for all past and present workers in the United States and military records for people who have served in the armed forces.

- 54 Agencies are always expanding their use of computers. Medical information can be found within seconds to

save lives. Police records can be sent to other locations minutes after a crime has occurred, helping to solve the crime. Schools and other agencies can transfer records easily when someone moves to another area of the country.

## 55 Education

Computers have become vital teaching devices. Computers make it possible to train and test workers in a range of professions. Office workers learn to use word processing software in their daily tasks. At the same time, they receive instruction on the proper use of grammar, spelling, punctuation, capitalization, and document formats. Airline pilots use computerized simulators to learn and improve skills needed for flying new types of aircraft.

- 56 **Computer-assisted instruction (CAI)** is the use of computers to help people learn or improve skills at their own pace. With CAI, students work at a speed that best serves their needs. The student does not have to go to a school building



How have computers changed the classroom in recent years?

for instruction. The student can learn at home on a computer network system connected to a central training location.

- 57 The demand for computer and *information technology* (IT) training in the workplace continues to grow. With the proper computer skills, you will be able to compete for some of the best-paying jobs in the business world.

## 58 Health Care

Computers are widely used in hospitals and other medical facilities. Uses range from keeping patient records to monitoring medications during surgery.

- 59 Medical professionals are also able to see to the healthcare needs of people in rural areas without leaving the city. The use of *telemedicine* with videoconference equipment allows diagnosis by a doctor in a different location, followed by treatment provided by a local healthcare professional. Technology of this type helps to expand the availability of health care in remote areas of less developed economies.

## 60 Financial Services

Paying bills online, checking your credit report, and selling stocks and bonds are just a few examples of computerized financial activities. Electronic banking and other financial services have made it possible for consumers to do business beyond usual banking hours. Each day, computers transfer billions of dollars. Payments to workers, businesses, and government flow through local and global computer networks.

- 61 Most people are familiar with credit cards and cash cards. You may not be aware of the existence of *smart cards*. These plastic cards with a silicon chip are used to store information. The chip within the card stores such data as your current account balance and credit history. It may even store medical information for emergencies.



Photodisc/Getty Images

What are some of the benefits of computers in science?

- 62 The card could serve as a personal record keeper for travel and other expenses. In addition, a smart card can be used to prove you paid for merchandise you want to exchange, to gain admittance to your place of work, or to unlock and start your car without keys.

### checkpoint ✓

What service industries make extensive use of computers?

### fyi

The use of mobile phones and other wireless technology is sometimes called “m-commerce” (m for mobile). Various handheld devices are expanding and enhancing e-commerce activities. Instant messaging, stock trading, banking, online buying, music, and sports video clips are most common. Close to 70 percent of the world’s population will be using wireless technology in the near future.



Joel Calheiros/Shutterstock.com

### Goal 3

Discuss e-commerce activities.

## 63 E-COMMERCE

You are walking through the mall. As you pass a clothing store, a message appears on your cell phone screen. "Now on special for spring, waterproof jackets, \$34.95." This targeted promotion is just one example of the fast, powerful capabilities of e-commerce and wireless technology.

64 **E-commerce** (*e* for *electronic*) refers to conducting business transactions using the Internet or other technology. These online business activities come in a range of forms. Almost every function of a company has been adapted to e-commerce. The most common e-commerce activities include:

- Providing product information
- Promoting a company
- Selling online
- Conducting market research
- Making payments
- Obtaining parts and supplies
- Tracking shipments

## 65 Types of E-Commerce

E-commerce opens up opportunities to companies previously limited by geographic, financial, or political restrictions. These online economic activities involve four basic models with two selling and buying parties: businesses (B) and consumers (C). See Figure 11-5.

66 The first and most familiar model is Business-to-Consumer, or B2C. Expanded sales of products in different geographic markets will create B2C



Do you think e-commerce provides more opportunities for the entrepreneur?

growth. Examples are online companies such as Amazon.com and Dell.

67 The second e-commerce model is Business-to-Business, or B2B. These online exchanges are the largest and fastest-growing segment of e-commerce. They account for more than 90 percent of Internet transactions. Examples are Ford and General Motors buying parts online from their suppliers.

68 Consumer-to-Business (C2B) is the third e-commerce model. In C2B, consumers originate online transactions through price offers to businesses. The online company Priceline was one of the first companies in this category. Priceline allows shoppers to make bids for products and services such as airline tickets and hotels. The airline and hotel companies then decide whether to accept the offers. Although C2B activity is not a big part of e-commerce at this time, it could expand with new technologies and consumer initiatives.

► **Figure 11-5**

How does the Internet help each of these e-commerce models operate efficiently?

E-Commerce Matrix		
	Business Seller	Consumer Seller
Business Buyer	B2B	C2B
Consumer Buyer	B2C	C2C

- 69 Finally, Consumer-to-Consumer (C2C) is the fourth e-commerce model. In the long economic tradition of bartering and auctions, buying and selling among consumers is growing in cyberspace. The ease and speed of transactions among online parties is encouraging more C2C exchanges. An example is the online company eBay.

## 70 Global E-Commerce

Internet-based computer systems, along with software that translates information from one language to another, make it possible to do business around the world without leaving your computer. Instant transmission of data with the use of satellites makes even the farthest point on earth as close as a button on your computer. Increased global business can have an important impact on world trade and international relations.

- 71 Importing and exporting can take place using a computer system. The goods are shipped from the closest location to save time and money. For example, you may order an item from a company in Italy using your computer. When the Italian marketers receive your order on their computer, they check a database and find there are five such items in stock in Canada.



Have you purchased products online? Conducted searches for product information online? Do you have ideas for products you would like to sell online? Explain how you believe the growth of e-commerce will affect the life-span goals you set or your ability to achieve them.

- 72 They instruct the Canadian importers through the Internet to ship the items to you. You receive them the next day.

You pay the Italian company. Later, the Italian and Canadian companies settle their accounts through the computerized banking system.

- 73 Another way of bringing people together to do business is *videoconferencing*. This system allows people in different geographic locations to meet "face-to-face" by satellite. It is used for sales presentations, training sessions, and other types of meetings. A sales staff in Peru can make a presentation to potential customers in Spain, South Africa, Pakistan, and the United States without leaving their offices in Lima.

### checkpoint ✓

What do the notations B2C and B2B mean?

## 11-2 Assessment

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### Key Concepts

Determine the best answer.

1. An example of external data would be
  - a. a company sales report
  - b. a list of employee qualifications
  - c. a government economic forecast
  - d. payroll records
2. CAI refers to
  - a. paying bills online
  - b. electronic inventory control
  - c. providing health care to remote areas
  - d. individualized instruction

3. When a packaged food producer sells items to a restaurant, this is considered to be a \_?\_ e-commerce transaction.

a. B2C	c. C2B
b. B2B	d. C2C

### Make Academic Connections

4. **Visual Art** Create a visual presentation of a management information system for a specific information flow for a company of your choice.
5. **Culture** Research other cultures to determine how people in these societies might react to various aspects of e-commerce.

StudyTools



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# 11-3 Other Technology Issues



## Goals

- 1 Explain workplace uses of technology.
- 2 Identify home and personal applications of technology.
- 3 Discuss social concerns related to technology.

## Key Terms

- robotics 276  
artificial intelligence (AI) 276  
expert system 277  
computer-aided design (CAD) 277  
telecommuting 277  
piracy 280  
computer virus 280

## Focus on REAL LIFE

Herb Cunningham is a talented worker, but he has seen demand for his skills as a bookkeeper declining. More and more, computerized accounting systems are keeping track of sales and expenses in companies.

"I guess it's time to upgrade my technology skills," Herb commented to his son, Joe. "I'm going to enroll in an online training class for accounting software."

"That's a good idea, but it might not be enough, Dad," responded Joe. "You should learn how to use spreadsheets, work with tax software, and learn about supporting computer-based accounting systems."

"I'm not sure I'll be able to learn how to do all of those things," was Herb's reply.

"But, Dad, I'll be here to help you," said Joe. "We are learning how to use this type of software in school. My teacher has also told us that the local college is using computer-assisted instruction to teach modern bookkeeping practices."

### Goal 1

Explain workplace uses of technology.

## 75 WORKPLACE TECHNOLOGY

Computers are present in almost every business situation. They help improve efficiency and productivity. Computers can be found in oil fields, warehouses, retail stores, hospitals, offices, and factories.

24 hours a day. These computerized workers can perform in dangerous situations such as in outer space, underwater, or underground. The use of domestic robots is growing in the home with robots that can clean floors, clean pools, mow lawns, or entertain.

## 76 Robotics

Most of you have seen robots and other computer systems in science fiction movies set in outer space and in the future. In real life, **robotics** involves mechanical devices programmed to do routine tasks, such as those in many factories. An example of work where robots are used is assembly line work that requires repetitive tasks.

- 77 Early robots did only simple tasks such as tightening a bolt on an automobile. Today, robots exist that can see, hear, smell, and feel. Robots are able to work

## 78 Expert Systems

Have you ever wanted a quick answer to a question without having to find a book or person who knew the answer? **Artificial intelligence (AI)** is software that enables computers to reason, learn, and make decisions. It uses logical methods similar to the methods humans use. An example of artificial intelligence is computer programs that make decisions about complex topics. For example, software exists that asks people questions about their health in order to determine solutions for potential medical problems. This software allows

people in areas without doctors to receive better medical care.

- 79 Computer programs that help people solve technical problems are called **expert systems**. They are now available for medical services, financial planning, and legal matters. Expert systems are based on the knowledge of human experts in many specialized areas. These systems provide intelligent answers as effectively as human experts in those subject matters. For example, employees of the Internal Revenue Service use an expert system to quickly answer questions from taxpayers.

## 80 Computer-Aided Design

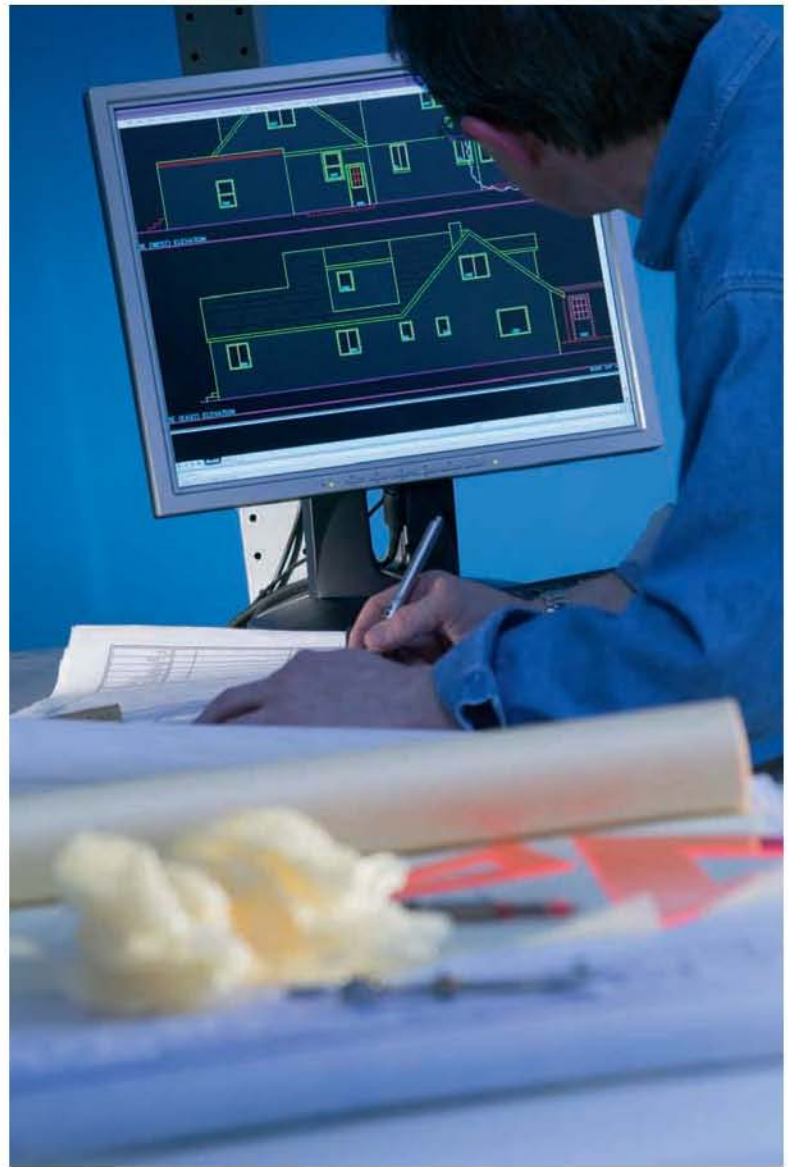
Computers created many of the products you use each day. **Computer-aided design (CAD)** refers to the use of technology to create product styles and designs. CAD allows you to try different sizes, shapes, and materials for a new machine, automobile, or food package. This process can be used to experiment with many variations before spending time and money building a model or going into production.

## 81 Telecommuting

Each morning, more than 20 million Americans travel to their offices—in another room of their homes! These people do all or part of their work at home.

**Telecommuting** involves the activities of a worker using a computer at home to do a job. Telecommuting saves travel time and costs. It results in less traffic along with reduced noise and air pollution.

- 82 Each year more and more people become telecommuters. This working arrangement is especially attractive to people who have a hard time leaving their home to go to work. These include workers who are disabled or parents who desire to be with their young children. A work-at-home arrangement is most common among workers such as writers and



Comstock/Getty Images

What types of businesses might use computer-aided design?

editors, researchers, accounting clerks, sales representatives, computer programmers, and website designers.

- 83 These workers can easily send their reports, documents, and ideas to their employers by computer. Telecommuting is made possible with computers and other technology. E-mail and faxes allow a person to communicate with the company's main office.

### checkpoint ✓

How is computer-aided design (CAD) used by businesses?

## Goal 2

Identify home and personal applications of technology.

### 84 HOME AND PERSONAL TECHNOLOGY

Computers not only change the way you work, but technology also affects almost all aspects of life.

### 85 School and Homework

Internet studies reveal that computers are a key homework tool for students. For many students, more than one-third of homework time involves the computer. More than 80 percent of all students use the computer as an important homework resource.

86 Students today find many uses for the computer. Online information sources, presentation software, and other technology increase your ability to communicate and use ideas.

### 87 Home Robotics

Robots are no longer just in factories and businesses. Computerized systems now exist for repetitive chores such as vacuuming and mowing the lawn. Toys and other electronic devices for children can both entertain and educate. In the future, you can expect home robots to monitor household appliances, roll trash cans to the street, and assist the elderly with lifting heavy items.



Photodisc/Getty Images

What are some types of software that can make household activities easier?

### 88 Household Record Keeping

Computer systems are becoming information centers in people's homes. They are used for sending and receiving e-mail, shopping online, keeping financial records, completing homework assignments, and downloading music and videos.

89 Programs can keep a list of names and addresses of people to whom you send greeting cards. You may store your favorite recipes by categories. A family's medical history can be kept on file. You can have an inventory of household items for insurance records in case of theft or damage. In addition, computer programs may be used for personal financial record keeping, budgeting, writing checks, and preparing your income tax return.

## NETBookmark

Businesses want to maximize the number and quality of visitors to their websites through search engine results. What can businesses do to use search engines to market their company? Access the website shown below and click on the link for Chapter 11. Obtain suggestions for businesses to maximize the number and quality of visitors.

[www.cengage.com/school/genbus/pob](http://www.cengage.com/school/genbus/pob)

### checkpoint ✓

What types of technology tools are available to students?

## SOCIAL CONCERNS OF TECHNOLOGY

New technology will continue to expand the potential uses of computers in business. New software will eliminate some jobs while increasing job growth in others. It will also continue to change the way work is done.

- 91 Expanded computer use has resulted in concerns about health and safety, criminal activities, and privacy. While computers are beneficial to society, the wise person will not place complete faith in the reliability or safety of computer systems.

### 92 Employment Trends

Many people think computers are taking away their jobs. What is actually occurring is a shift in the job duties and skills needed to work in business and industry. When computers replace workers, companies need to retrain the workers with skills in programming, operating, or repairing computer systems.

- 93 *Displaced* workers are workers who are unemployed because of changing job conditions. They must adapt to the changing job market in order to have continued employment. What actions can companies and workers take to be ready for the new jobs of the future?

- 94 Computers and other technology are becoming more important in our lives each day. The ability to use this technology is vital to each person's economic survival. *Computer literacy* is the ability to use computers to process information or solve problems. You do not have to understand how to program a computer in order to use it. You do need to know how to enter, store, process, and retrieve information.

### 95 Health Concerns

Various products and substances can be dangerous. While little danger exists from using computers and other technology,

some people have encountered discomfort resulting from on-the-job activities. For example, eyestrain and vision problems have been linked with prolonged work at computer screens. Muscle tension and nerve damage can occur from too many hours at a keyboard. These and other concerns have resulted in guidelines from labor organizations and government agencies for safe computer operation.

### 96 Computer Crime

Widespread use of computers has led to an increase in white-collar crime. *White-collar crime* is illegal acts carried out by office or professional workers while at work. Workers may steal money, information, or computer time through improper use of databases or illegal access to computer systems.

- 97 While the typical bank robbery results in a loss of \$10,000, computer crimes involving bank records average hundreds of thousands of dollars. Theft of a physical

### Goal 3

Discuss social concerns related to technology.



What concerns have resulted from the use of computer technology?

The workplace is constantly changing because of technology. Some jobs are eliminated, while others are created. Describe various career skills and activities that will be needed to work with technology in the future.

item is obvious. Theft of computer time or information from a database is usually harder to detect.

- 98 **Piracy** is stealing or illegally copying software packages or information. It can be a significant problem. In some countries, between one-third and one-half of the software used is obtained illegally. Companies that develop software may lose more than half of their profits to information pirates who violate the law. Copyright laws apply to software as well as books and music.
- 99 Destructive efforts are also a concern to computer users. A **computer virus** is program code hidden in a system that can later do damage to software or stored data. The virus may be programmed to become active on a certain date or when certain data is accessed. Some computer viruses are harmless, only showing up as a funny message. Others have been known to destroy critical government records.

## 100 Privacy Concerns

One of the greatest challenges facing computer users is the need to guarantee privacy. Some dishonest people have learned how to illegally access computer databases. While some laws exist to protect your privacy, many concerned people believe these regulations are not strong enough. Some businesses are becoming stricter about who can access and use company information. Tighter security systems are being developed. Some organizations change the password needed to access information several times a day to protect their databases.

- 101 In recent years, *identity theft* has become a major concern for consumers and companies. Thieves obtain information online about a person. They apply for a credit card in the person's name or access the bank account of that person. According to the Federal Trade Commission, 9 million people have their identities stolen in the United States each year. Con artists illegally obtain millions of dollars each year through identity theft.

### checkpoint ✓

How do companies suffer from software piracy?

## 11-3 Assessment



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### Key Concepts

Determine the best answer.

- Telecommuting refers to
  - the use of computers to design products
  - working at home by computer
  - difficulties from overusing computers
  - illegal acts of office workers
- Hidden software code that can damage computer operations is
 

a. piracy	c. a virus
b. a displaced worker	d. computer literacy

- Illegal acts carried out by office or professional workers while at work are referred to as
 

a. computer crime	c. piracy
b. identity theft	d. white-collar crime

### Make Academic Connections

- Communication** Prepare a memo that sets out the benefits of telecommuting for an organization. In your memo, present specific details of a job that would be appropriate for telecommuting.
- Music** Select three different types of music. Discuss how each might be appropriate or inappropriate for an office setting to reduce stress associated with working on computers.

# Business Improving Society

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## Green America

*Every time you spend or invest a dollar, it goes to work in the world.*

—Green America website

Green America is an organization with a vision. The vision includes a world where:

- All people have enough
- All communities are healthy and safe
- The bounty of the earth is preserved for generations to come

The organization was founded on the belief that your purchases can support businesses that create jobs, care about their communities, engage in fair trade, and protect the environment. The mission is “to harness economic power—the strength of consumers, businesses and the marketplace—to create a socially just and environmentally sustainable society.”

Green America was started in 1982 under the name Co-op America to provide practical tools to address today’s social and environmental problems. While many environmental organizations fight political and legal battles, Green America educates people and business about making improvements through the economic system. Descriptions of some of their programs are shown below.

- **Climate Action Campaign** Encourages consumers and businesses to minimize their carbon footprint and offers strategies for pressuring corporate polluters to take climate change seriously.
- **Green Business** Provides resources for businesses interested in being socially and environmentally responsible.
- **Green Energy** Focuses on actions that will reduce energy consumption, reduce dependence on fossil fuels, and take advantage of renewable energy.



vishureddy/Stockphoto.com

How is a farmer in a developing country helped when you purchase a fair trade cotton shirt?

- **Fair Trade** Encourages businesses and consumers to participate in fair trade to ensure that farmers and artisans around the world receive a fair price for their products.
- **Responsible Shopper** Profiles hundreds of companies and offers guidance for shopping decisions that promote corporate responsibility.
- **Social Investing** Suggests strategies for making socially and environmentally responsible investment decisions.

Green America publishes a variety of materials. The organization’s National Green Pages is a directory of America’s leading socially and environmentally responsible businesses.

Green America has 100,000 individual members and 4,000 member businesses that work together to achieve the goals of the organization. In addition, Green America manages the Social Investment Forum, a trade organization for socially responsible investing professionals.

Each day, Green America encourages consumers to rethink their buying habits. Your purchases should be with companies that are trying to become more socially and environmentally responsible. Investors are encouraged to support socially responsible companies. Most importantly, Green America wants consumers, investors, and businesses to demand change.

### Think Critically

1. How does Green America serve consumers and businesses in our society?
2. What aspect of Green America do you believe is most valuable for people in your state or community?
3. Go to the website of Green America to obtain additional details about the activities of this organization.



## Business Notes

### 11-1 Computer Systems

- Computer systems consist of four main components: the input device, the processing unit, the memory and storage facilities, and an output device.
- Commonly used input devices include the keyboard, mouse, video game controllers, touch-sensitive screens, scanners, and voice-activated mechanisms.
- The main types of storage devices are the internal memory in a computer and external memory such as disks, CDs, DVDs, magnetic tape, and flash memory sticks. Data processing results are reported as text output, graphics output, audio output, or video output.

### 11-2 Business Applications of Technology

- The four main components of a management information system (MIS) are gathering data, analyzing data, storing data, and reporting results. The goal of an MIS is to change raw data (facts and figures) into information that can be used by managers.

- Service industries that make extensive use of computers and technology include public service organizations, educational institutions, healthcare facilities, and financial service organizations.
- E-commerce involves the conducting of business transactions over the Internet or through other electronic technology.

### 11-3 Other Technology Issues

- Robotics, expert systems, computer-aided design (CAD), and telecommuting are used in a variety of business situations to help improve efficiency and productivity.
- Personal technology applications include schoolwork, home robotics, and household recordkeeping.
- Expanded technology and computer use can result in concerns about job loss, health and safety, criminal activities, privacy, and identity theft.

## Communicate Business Concepts

1. Identify each of the following items as either *hardware* or *software*.
  - a. monitor (screen)
  - b. word processing program
  - c. chips
  - d. keyboard
  - e. operating system program
  - f. disk drive
  - g. mouse
  - h. printer
2. What are possible business activities currently performed by people that might be performed in the future using a computer system?
3. Identify whether word processing software, database software, spreadsheet software, or graphics software would be used to perform the following computer applications.
  - a. Preparing a report of new equipment purchased for each office of a company
  - b. Preparing a list of employees that is sorted by ZIP code
  - c. Creating a form letter to go to new customers of a mail-order business
  - d. Creating a pie chart showing the portion of sales of each product
  - e. Preparing a document listing the total sales for each geographic area of the country
  - f. Listing the employees who have not missed a day of work in five years
  - g. Sending a letter to each employee who has not missed a day of work in five years
4. List examples of (a) external data and (b) internal data used by most companies.
5. Who would benefit from schools that would allow students to take classes at home by computer?

6. Describe the benefits to workers, employers, and society when an organization allows some of its employees to do all or part of their work at home.
7. How has e-commerce expanded global business in countries that previously had limited economic activity?
8. How is it possible for the increased use of computers to create more jobs than are lost?
9. How might expert systems be used in the future to help people solve medical, legal, financial, and other technical problems?
10. What are potential benefits from the use of smart cards in handling everyday transactions?
11. What actions could be taken by organizations to prevent computer crime?

## Develop Your Business Language

Match the terms listed with the definitions.

12. Several computers linked into a single system.
13. Computer programs that perform specific tasks such as word processing, database management, or accounting.
14. Instructions that run a computer system.
15. The control center of the computer.
16. The combination of an input device, a processing unit, memory and storage facilities, and an output device.
17. Conducting business transactions over the Internet or using other technology.
18. Software that translates a computer user's commands and allows application programs to interact with the computer's hardware.
19. A system of letters, words, numbers, and symbols used to communicate with a computer.
20. The components or equipment of a computer system.
21. A series of detailed step-by-step instructions that tell the computer what functions to complete and when to complete them.
22. The use of computers to help people learn or improve skills at their own pace.
23. A term used to describe the activities of a worker using a computer at home to perform a job.
24. Mechanical devices programmed to do routine tasks.
25. Technological assistance used to create product styles and designs.
26. Stealing or illegally copying software packages or information.
27. Programs that assist people in solving technical problems.
28. An organized system of processing and reporting information in an organization.
29. A program code hidden in a system that can later do damage to software or stored data.
30. Programs that enable computers to reason, learn, and make decisions using logical methods similar to the methods humans use.

### KEY TERMS

- a. application software
- b. artificial intelligence (AI)
- c. central processing unit (CPU)
- d. computer language
- e. computer network
- f. computer system
- g. computer virus
- h. computer-aided design (CAD)
- i. computer-assisted instruction (CAI)
- j. e-commerce
- k. expert systems
- l. hardware
- m. management information system (MIS)
- n. operating system software
- o. piracy
- p. program
- q. robotics
- r. software
- s. telecommuting

## Make Academic Connections

31. **Technology** Research types of input, output, and memory devices that have recently been developed for use by businesses and individuals. Find an example of each type of device and write a paragraph about each one.
32. **Communication** Talk to people who make online purchases. What types of products do they buy most frequently? What do they like best about shopping online? What concerns do they have about buying online? Prepare a table with a summary of your findings.
33. **Technology** Prepare a list of daily activities and information items that might be included in the processing and storage capabilities of a smart card. Using information from your list, provide an example of a situation where a smart card might be used.
34. **Science** Investigate various uses of telemedicine and telesurgery in the United States and in other areas of the world.
35. **Math** The Barkley Corporation usually sends about 3,800 pieces of mail per month at \$0.42 each. If the firm switches to e-mail service at a cost of \$1,250 per month, how much money would it save or lose? What other factors should the company consider before making this change?
36. **Geography** Many nations around the world do not have reliable telephone service. As a result, cell phones and wireless communication has grown at a fast pace in these countries. Conduct research and prepare a map reporting the countries with a significant usage rate of wireless communication.
37. **Technology** Research recent computer viruses. What types of damage do various viruses do to computer systems? How can you protect your computer against virus attacks?
38. **Law** Conduct an Internet search to obtain information about avoiding identity theft. Make a list of 10 ways to protect your identity. Write a short explanation of how each of the protection strategies helps protect your identity.
39. **Read** Find a news article that relates to e-commerce. Read the article and outline the major concepts presented in the article using bullet points. Include a properly formatted citation for your source. Possible sources include printed and online versions of newspapers or magazines. You should also consider independent online sources that produce original content.

## Decision-Making Strategies

The Kendall Manufacturing Company assembles electronic devices used in offices and homes. They employ about 600 people in various office, factory, and warehouse positions. Currently, all factory and warehouse jobs are done manually.

Managers at Kendall are considering replacing 150 assembly line workers with a computerized system. The

company can save \$135,000 a year in operating costs by using this new technology.

40. What factors should the company consider before using the computerized assembly line system?
41. If the company uses this new system, what should the company do to help workers who are displaced by this technology?

## Linking School and Community

Talk with a few members of your community about the computers and technology they use on the job. Ask them to describe technology changes they have seen in their jobs during the last year and during the last three

years. Also ask them to identify the computer skills they think are important for career success. Prepare a one-minute presentation that summarizes your findings.



## Web Workout

The number and popularity of social networking sites on the Internet continue to grow. Social networking websites allow multiple users to communicate through an individual's website. There are a wide variety of social networking sites with many users. Facebook alone has over 500 million users worldwide. The enjoyment and convenience of a social networking site is tempered by concerns about illegal and unethical behavior. All users need to take precautions when using these sites.

### Think Critically

1. Make a list of the activities that people participate in while using social networking sites.
2. Make a list of problems that might arise when using social networking sites.
3. Use the Internet or library resources to identify recommendations for safe social networking practices. Create a one-page flyer of tips for social network users.

## Internet Marketing Plan

In the twenty-first century, business success depends on the ability to communicate ideas and concepts using the Internet and related technologies. The purpose of the Internet Marketing Plan Event is to provide an opportunity for the participants to research and design a plan to start an Internet marketing business or enhance a component of an existing Internet marketing business. This event challenges students to design a plan that will enhance recognition and increase sales. Students must follow the marketing plan format provided by DECA. This event can be completed by one person or teams of 2 or 3 members.

You must design a market research study to identify the potential for Internet marketing and prepare a business plan based on your research. Major sections for the Internet marketing plan include analysis of the business situation, proposed business outline, and a conclusion.

You will have 10 minutes to present your Internet marketing plan to the judge or class. Five minutes are scheduled following the presentation for the judge or class to ask questions. Your oral presentation must be supported by relevant research and demonstrate an understanding of the business for which the Internet marketing plan was developed.

### Performance Indicators Evaluated

- Conduct business research.
- Prepare a business plan based on marketing research.



- Demonstrate critical thinking and problem-solving skills.
- Work effectively as a team.
- Prioritize tasks and practice time management.
- Demonstrate oral and written communication skills.

You will be evaluated for:

- Quality of research findings and conclusions
- Credibility of the proposed business outline
- Ability to present facts and information in a convincing manner

*For more detailed information about performance indicators, go to the DECA website.*

### Think Critically

1. Why must the Internet marketing plan be based upon research?
2. Why are businesses using Internet marketing?
3. What is a disadvantage of using Internet marketing?
4. What product information needs to be included in an Internet marketing plan?

[www.deca.org](http://www.deca.org)