

INFORMATION TECHNOLOGY, THE INTERNET, AND YOU

OBJECTIVES

After you have read this chapter, you should be able to:

1

Explain the five parts of an information system: people, procedures, software, hardware, and data.

2

Distinguish between system software and application software.

3

Discuss the four kinds of system software programs.

4

Distinguish between special-purpose and general-purpose application software.

5

Identify the four types of computers and the three types of microcomputers.

6

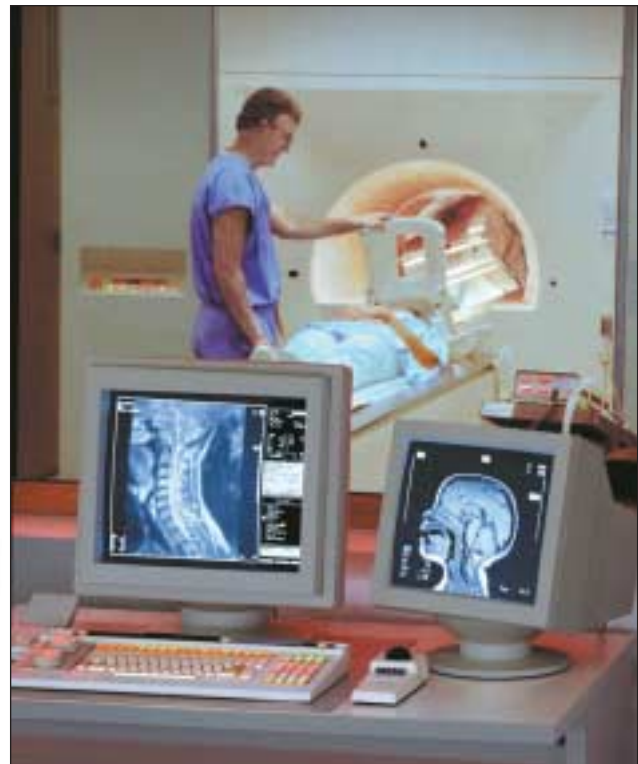
Describe the different types of computer hardware including the system unit, input, output, storage, and communication devices.

7

Define data and describe document, worksheet, database, and presentation files.

8

Explain computer connectivity, the wireless revolution, and the Internet.



Information Technology (IT): Just as the Internet and the Web have affected all of us, they have affected computer technology as well. Today, communication links to the Internet are a common feature of almost all computer systems. Information technology is a modern term that describes this combination of traditional computer and communication technologies.

The purpose of this book is to help you use and understand information technology. This involves two aspects: computer competency and computer knowledge. Computer competency refers to acquiring computer-related skills. These skills are indispensable tools for today. They include how to efficiently and effectively use popular application packages and the Internet. Computer knowledge is a deeper understanding of how technology works. It provides a foundation for you to understand how technology is being used today and how you might use technology in the future. For example, knowing how the Internet works provides the foundation for you to understand the potential of electronic commerce and to understand how information about you can be collected and dispensed without your consent.

In this chapter, we first present an overview of an information system: people, procedures, software, hardware, and data. It is essential to understand these basic parts and how connectivity through the Internet and the Web expands the role

of information technology in our lives. In subsequent chapters, we will describe these parts of an information system in detail.

Fifteen years ago, most people had little to do with computers, at least directly. Of course, they filled out computerized forms, took computerized tests, and paid computerized bills. But the real work with computers was handled by specialists—programmers, data entry clerks, and computer operators.

Then microcomputers came along and changed everything. Today it is easy for nearly everybody to use a computer. Now:

- Microcomputers are common tools in all areas of life. Writers write, artists draw, engineers and scientists calculate—all on microcomputers. Students and businesspeople do all this, and more.
- New forms of learning have developed. People who are homebound, who work odd hours, or who travel frequently may take courses on the Web. A college course need not fit within the usual time of a quarter or a semester.
- New ways to communicate, to find people with similar interests, and to buy goods are available. All kinds of people are using electronic mail, electronic commerce, and the Internet to meet and to share ideas and products.

What about you? How are you using information technology? Many interesting and practical uses have recently surfaced to make our personal lives richer and more entertaining. These applications range from recording digital video clips to creating personalized Web sites.

To be competent and knowledgeable with IT, you need to know the five parts of an information system: people, procedures, software, hardware, and data. Additionally, you need to understand connectivity, the wireless revolution, the Internet, and the Web and to recognize the role of information technology in your personal and professional life.

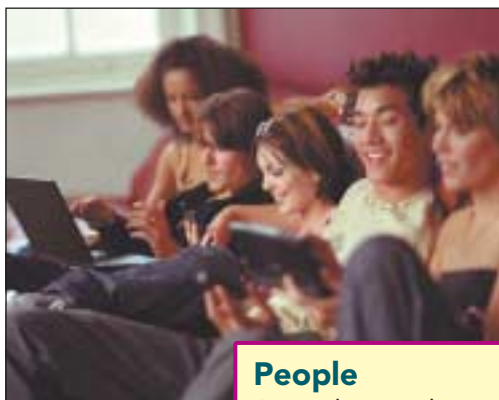


INFORMATION SYSTEMS

An information system has five parts: people, procedures, software, hardware, and data. Connectivity allows computers to connect and share information, thereby greatly expanding the capability and usefulness of an information system.

When you think of a microcomputer, perhaps you think of just the equipment itself. That is, you think of the monitor or the keyboard. Yet, there is more to it than that. The way to think about a microcomputer is as part of an information system. An **information system** has five parts: *people, procedures, software, hardware, and data*. (See Figure 1-1.)

- **People:** It is easy to overlook people as one of the five parts of a microcomputer system. Yet this is what microcomputers are all about—making **people, end users** like you, more productive.
- **Procedures:** The rules or guidelines for people to follow when using software, hardware, and data are **procedures**. These procedures are typically documented in manuals written by computer specialists. Software and hardware manufacturers provide manuals with their products. These manuals are provided either in printed or electronic form.
- **Software:** A **program** consists of the step-by-step instructions that tell the computer how to do its work. **Software** is another name for a program or programs. The purpose of software is to convert **data** (unprocessed facts) into **information** (processed facts). For example, a payroll program would instruct the computer to take the number of hours you worked in a week



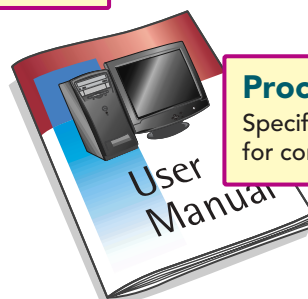
People

Are end users who use computers to make themselves more productive



Software

Provides step-by-step instructions for computer hardware



Procedures

Specify rules or guidelines for computer operations

Figure 1-1 The five parts of an information system

(data) and multiply it by your pay rate (data) to determine how much you are paid for the week (information).

- **Hardware:** The equipment that processes the data to create information is called **hardware**. It includes the keyboard, mouse, monitor, system unit, and other devices. Hardware is controlled by software.
- **Data:** The raw, unprocessed facts, including text, numbers, images, and sounds are called data. Processed, data yields information. Using the example above, the data (number of hours worked and pay rate) are processed (multiplied) to yield information (weekly pay).

Almost all of today's computer systems add an additional part to the information system. This part, called **connectivity**, allows computers to connect and to share information. These connections, including Internet connections, can be by telephone lines, by cable, or through the air. Connectivity allows users to greatly expand the capability and usefulness of their information systems.

In large computer systems, there are specialists who write procedures, develop software, and capture data. In microcomputer systems, however, end users often perform these operations. To be a competent and knowledgeable end user, you must understand the essentials of **information technology (IT)**, including software, hardware, and data.

Concept Check

- ✓ What are the five parts of an information system?
- ✓ What is the difference between data and information?
- ✓ What is connectivity?



Data

Consist of unprocessed facts including text, numbers, images, and sounds

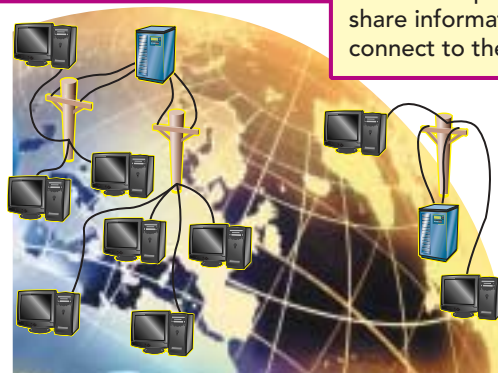
Hardware

Includes keyboard, mouse, monitor, system unit, and other devices



Connectivity

Allows computers to share information and to connect to the Internet



PEOPLE

People are the most important part of an information system. Features in this book include Making IT Work for You, Tips, and two interactive CDs.

Although easy to overlook, people are surely the most important part of any information system. Our lives are touched every day by computers and information systems. Many times the contact is direct and obvious, such as when we create documents using a word processing program or when we connect to the Internet. Other times, the contact is not as obvious. Consider just the four examples in Figure 1-2.

Throughout this book you will find a variety of features designed to help you become computer competent and knowledgeable. These features include Making IT Work for You, Tips, and two interactive CDs.

- **Making IT Work for You.** In the chapters that follow, you will find Making IT Work for You features that present interesting and practical IT applications. Using a step-by-step procedure, you are provided with specific instructions on how to use each application. Figure 1-3 presents a list of these applications.



Figure 1-2 Computers in business, entertainment, education, and medicine

INFORMATION TECHNOLOGY TOPICS

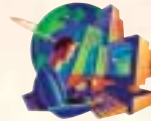


Information technology touches our lives every day in a personal way. Many interesting and practical uses of IT have recently surfaced to make our lives richer and more entertaining. In the following chapters, you will find these applications presented in detail.

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Instant Messaging Do you enjoy chatting with your friends? Have you ever worked on a group project and had problems getting everyone together for a meeting? Perhaps instant messaging is just what you're looking for. See page XX.



Digital Photography Want to edit your photos on your computer? Would you like to share your photos with family and friends over the Web? Digital photography makes it easy to do. See page XX.



Web-based Applications Would you like access to free general-purpose applications from anywhere in the world? Would you like to be able to access to your data files from almost any computer? You can have it all with Web-based applications. See page XX.



Internet Telephony Would you like to make long distance calls at little or no cost? You can use your computer to make long distance calls to almost any telephone in the world. All you need is the right software and an Internet connection to get started. See page XX.



Personal Web Site Do you have anything to share with the world? Would you like to create a personal Web without having to learn any special Web publishing programs? Would you like to put your personal Web site on the Web without having to pay for server time? Many services are available to get you started for FREE! See page XX.



Music from the Internet Did you know that you can use the Internet to locate music, download it to your computer, and create your own compact discs? All it takes is the right software, hardware, and a connection to the Internet. See page XX.



Virus Protection Has your computer ever been attacked by a computer virus? If not, chances are that it will be in the near future. Fortunately, special software is available to protect you against computer viruses . . . some of the software is even free! See page XX.



Home Networking Computer networks are not just for corporations and schools anymore. If you have more than one computer, you can use a wireless home network to share files and printers, to allow multiple users access to the Internet at the same time, and to play interactive computer games. See page XX.



TV Tuner Cards and Video Clips Want to watch your favorite television program while you work? Perhaps you would like to include a video clip from a television program or from a VHS tape in a class presentation. It's easy using a TV tuner card. See page XX.



Spyware Are you concerned about maintaining your privacy while you are surfing the Web? Did you know that programs known as spyware could be monitoring your every move? Fortunately, these programs are relatively easy to detect and remove. See page XX.



Job Opportunities Did you know that you can use the Internet to find a job? You can browse through job openings, post your resume, and even use special programs that will search for the job that's just right for you. See page XX.

Figure 1-3 Making IT Work for You topics

- **Tips.** We all can benefit from a few tips or suggestions. Throughout this book you will find numerous Tips ranging from the basics of keeping your computer system running smoothly to how to protect your privacy while surfing the Web. For a partial list of the Tips presented in the following chapters, see Figure 1-4. For a complete list, go to <http://www.mhhe.com/oleary/CT05> and select Tips from Tim's Toolbox.
- **Interactive CDs.** This text is accompanied by two interactive CDs. One, **SimNet Concepts**, presents a series of interactive tutorials on a variety of important IT subjects. The other CD, **Computing Today**, contains animations of key concepts, videos relating to select Making IT Work for You applications, and in-depth coverage of select topics. (See Figure 1-5.)

TIPS

- **Controlling spam.** Do you get a lot of unwanted e-mail advertisements? Americans receive over 200 billion spam e-mails every year. There are some basic steps that you can take to keep your inbox spam-free. See page XX.
- **Recovering from a power failure.** Have you ever been working on a document when the power goes off? Your original document and all your recent changes are gone. Fortunately, most applications automatically save your work every few minutes to a temporary recovery or backup file. It's easy to get back under way again. See page XX.
- **Improving slow computer operations.** Does your computer seem to be getting slower and slower? Consider a few suggestions that might add a little zip to your current system. See page XX.
- **Improving hard disk performance.** Does your internal hard-disk drive run a lot and seem slow? Are you having problems with lost or corrupted files? To clean up the disk and speed up access, consider defragging. See page XX.
- **Protecting your privacy.** Are you concerned about your privacy while on the Web? Consider some suggestions on protecting your identity online. See page XX.

Figure 1-4 Selected Tips



Figure 1-5 Two interactive CDs: SimNet Concepts and the Computing Today CD

SOFTWARE

There are two kinds: system software and application software. System software includes operating systems, utilities, and device drivers. Application software is categorized as general-purpose and special-purpose.

Software, as we mentioned, is another name for programs. Programs are the instructions that tell the computer how to process data into the form you want. In most cases, the words software and programs are interchangeable. There are two major kinds of software—*system software* and *application software*. You can think of application software as the kind you use. Think of system software as the kind the computer uses.

SYSTEM SOFTWARE

The user interacts primarily with application software. **System software** enables the application software to interact with the computer hardware. System software is “background” software that helps the computer manage its own internal resources.

System software is not a single program. Rather it is a collection of programs:

- **Operating systems** are programs that coordinate computer resources, provide an interface between users and the computer, and run applications. Windows XP and the Mac OS X are two of the best-known operating systems for today’s microcomputer users. (See Figure 1-6.)
- **Utilities**, also known as **service programs**, perform specific tasks related to managing computer resources. For example, the Windows utility called Disk Defragmenter locates and eliminates unnecessary file fragments and rearranges files and unused disk space to optimize computer operations.
- **Device drivers** are specialized programs designed to allow particular input or output devices to communicate with the rest of the computer system.

APPLICATION SOFTWARE

Application software might be described as end user software. These programs can be categorized as either *general-purpose* or *special-purpose applications*.

General-purpose applications, or **basic applications**, are widely used in nearly all career areas. They are the kinds of programs you have to know to be considered computer competent. One of these basic applications is a browser to



Figure 1-6 Windows and Mac operating systems



TIPS

Have you used the Internet? If so, then you probably already know how to use a browser. For those of you who do not, here are a few tips to get you started.

- 1 **Start browser.** Typically, all you need to do is double-click the browser's icon on the desktop.
- 2 **Enter URL.** In the browser's location box, type the URL (uniform resource locator, or address) of the Internet or Web location (site) that you want to visit.
- 3 **Press ENTER.** On your keyboard, press the ENTER key to connect to the site.
- 4 **Read and explore.** Once connected to the site, read the information displayed on your monitor. Using the mouse, move the pointer on the monitor. When the pointer changes from an arrow to a hand, click the mouse button to explore other locations.
- 5 **Close browser.** Once you are done exploring, click on your browser's CLOSE button.

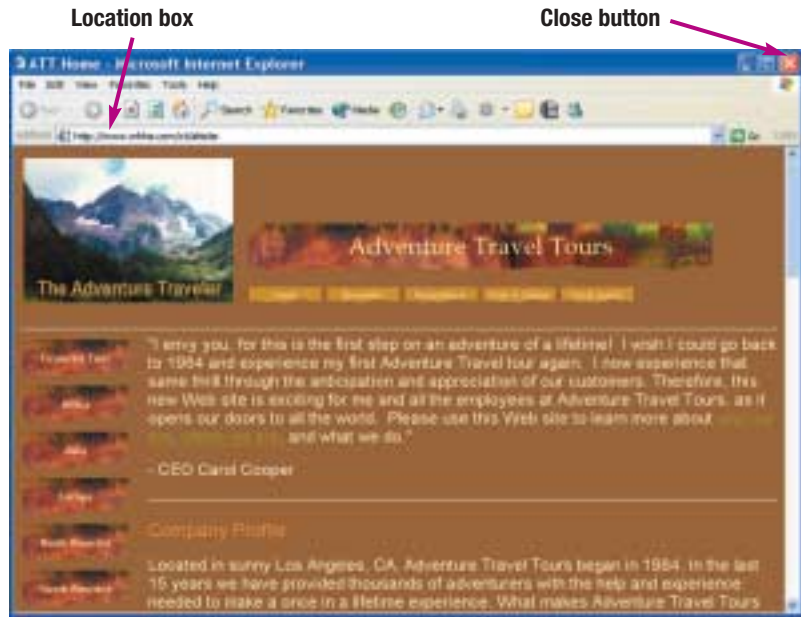


Figure 1-7 Internet Explorer browser

Figure 1-8 Basic applications

Type	Description
Browser	Connect to Web sites and display Web pages
Word processor	Prepare written documents
Spreadsheet	Analyze and summarize numerical data
Database management system	Organize and manage data and information
Presentation graphics	Communicate a message or persuade other people

Figure 1-9 Specialized applications

Type	Description
Graphics	Includes programs designed to create presentations, to analyze data, or to create and edit images
Audio and video	Capture and edit audio and video files
Multimedia	Develop interactive presentations that include audio, video, text, and/or graphical elements
Web authoring	Create and edit Web pages
Artificial intelligence	Programs that attempt to mimic or simulate human senses, thought processes, and/or actions.

navigate, explore, and find information on the Internet. (See Figure 1-7.) The two most widely used browsers are Microsoft's Internet Explorer and Netscape's Navigator. For a summary of the basic applications, see Figure 1-8.

Special-purpose applications, also known as **advanced applications**, include thousands of other programs that are more narrowly focused on specific disciplines and occupations. Some of the best known are graphics, audio and video, multimedia, Web authoring, and artificial intelligence programs. For a description of these programs, see Figure 1-9.

Concept Check

- ✓ Describe the two major kinds of software.
- ✓ Describe three types of system software programs.
- ✓ Define and compare general-purpose and special-purpose applications.

HARDWARE

Four types of computers are supercomputer, mainframe computer, minicomputer, and microcomputer. Microcomputer hardware consists of the system unit, input/output, secondary storage, and communications devices.

Computers are electronic devices that can follow instructions to accept input, process that input, and produce information. This book focuses principally on microcomputers. However, it is almost certain that you will come in contact, at least indirectly, with other types of computers.

TYPES OF COMPUTERS

There are four types of computers: supercomputers, mainframe computers, minicomputers, and microcomputers.

- **Supercomputers** are the most powerful type of computer. These machines are special high-capacity computers used by very large organizations. For example, NASA uses supercomputers to track and control space explorations.
- **Mainframe computers** occupy specially wired, air-conditioned rooms. Although not nearly as powerful as supercomputers, mainframe computers are capable of great processing speeds and data storage. (See Figure 1-10.) For example, insurance companies use mainframes to process information about millions of policyholders.



Figure 1-10 Mainframe computer

- **Minicomputers**, also known as **midrange computers**, are refrigerator-sized machines. Medium-sized companies or departments of large companies typically use them for specific purposes. For example, production departments use minicomputers to monitor certain manufacturing processes and assembly line operations.
- **Microcomputers** are the least powerful, yet the most widely used and fastest-growing, type of computer. There are four types of microcomputers: *desktop*, *notebook*, *tablet PC*, and *handheld computers*. (See Figure 1-11.) **Desktop computers** are small enough to fit on top of or alongside a desk yet are too big to carry around. **Notebook computers**, also known as **laptop computers**, are portable, weigh between 4 and 10 pounds, and fit into most briefcases. A **tablet PC** is a type of notebook computer that accepts your handwriting. This input is digitized and converted to standard text that can be further processed by programs such as a word processor. **Handheld computers** are the smallest and are designed to fit into the palm of one hand. Also known as **palm computers**, these systems typically combine pen input, writing recognition, personal organizational tools, and communications capabilities in a very small package. **Personal digital assistants (PDA)** are the most widely used handheld computer.



Desktop



Notebook



Tablet PC



Handheld

Figure 1-11 Microcomputers

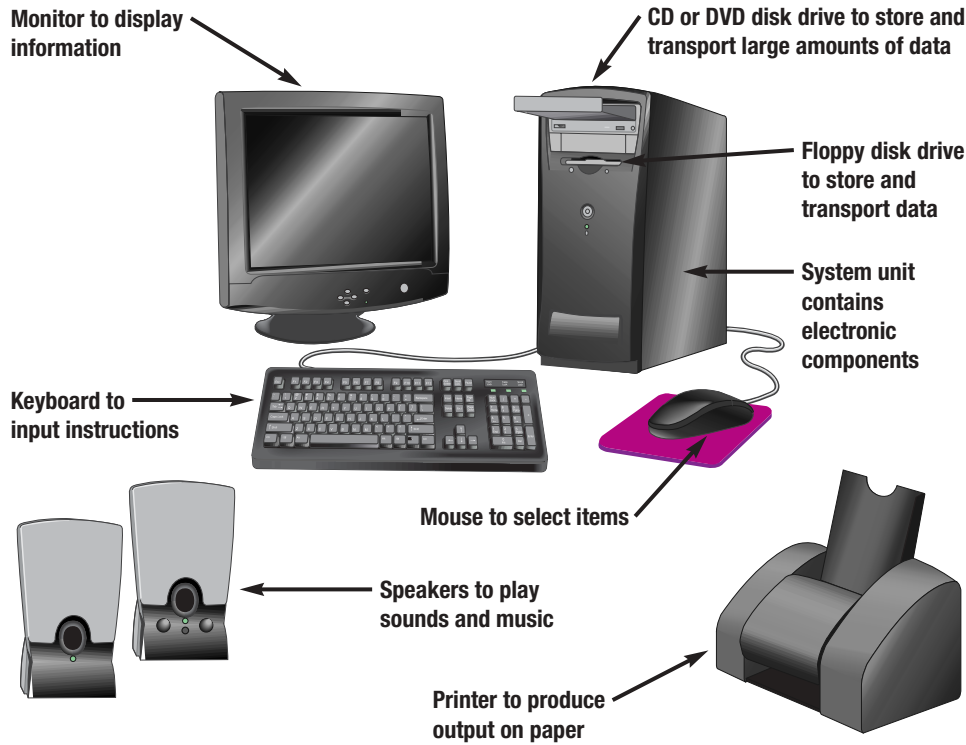


Figure 1-12 Microcomputer system

MICROCOMPUTER HARDWARE

Hardware for a microcomputer system consists of a variety of different devices. See Figure 1-12 for a typical desktop system. This physical equipment falls into four basic categories: system unit, input/output, secondary storage, and communication. Because we discuss hardware in detail later in this book, we will present just a quick overview of the four basic categories of microcomputer hardware: system unit, input/output, secondary storage, and communication.

- **System unit:** The system unit, also known as the **system cabinet** or **chassis**, is a container that houses most of the electronic components that make up a computer system. (See Figure 1-13.) Two important components of the system unit are the *microprocessor* and *memory*.

On the Web Explorations

Intel is a leading manufacturer of microprocessors. To learn more about this company, visit our Web site at <http://www.mhhe.com/oleary/CT05> and select On the Web Explorations from Tim's Toolbox.

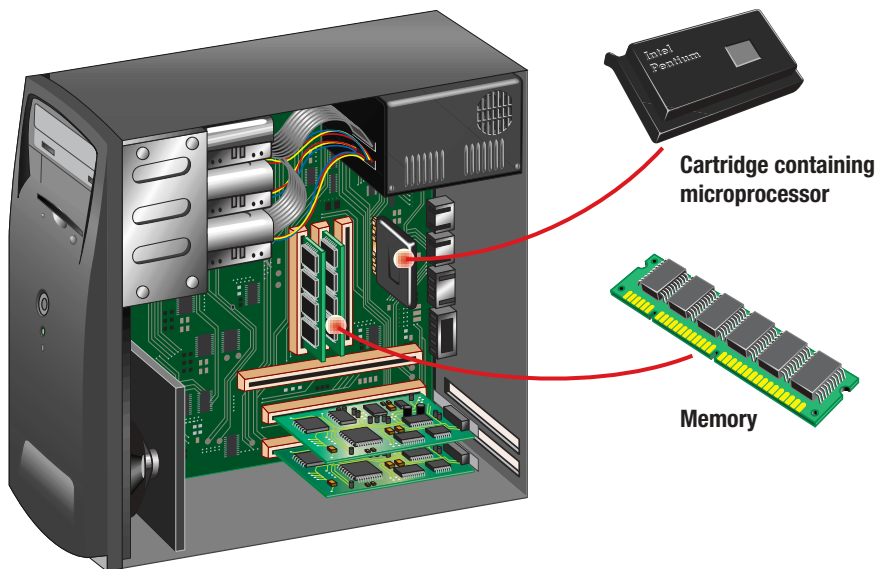


Figure 1-13 System unit

The **microprocessor** controls and manipulates data to produce information. Many times the microprocessor is contained within a protective cartridge. **Memory**, also known as **primary storage** or **random access memory (RAM)**, holds data and program instructions for processing the data. It also holds the processed information before it is output. Memory is sometimes referred to as **temporary storage** because its contents will typically be lost if the electrical power to the computer is disrupted.

- **Input/output: Input devices** translate data and programs that humans can understand into a form that the computer can process. The most common input devices are the **keyboard** and the **mouse**. (See Figure 1-14.) **Output devices** translate the processed information from the computer into a form that humans can understand. The most common output devices are **monitors** or **video display screens** (see Figure 1-15) and **printers**.
- **Secondary storage:** Unlike memory, **secondary storage devices** hold data and programs even after electrical power to the computer system has been turned off. The most important kinds of secondary media are *floppy*, *hard*, and *optical disks*. **Floppy disks** are widely used to store and transport data from one computer to another. (See Figure 1-16.) They are called floppy because data is stored on a very thin flexible, or floppy, plastic disk. **Hard disks** are typically used to store programs and very large data files. Using a rigid metallic platter, hard disks have a much greater capacity and are able to access information much faster than floppy disks. **Optical disks** use laser technology and have the greatest capacity. (See Figure 1-17.) The two basic types of optical disks are **compact discs (CDs)** and **digital versatile (or video) discs (DVDs)**.

On the Web Explorations

Toshiba is a leader in the development of DVD. To learn more about this company, visit our Web site at

<http://www.mhhe.com/oleary/CT05> and select On the Web Explorations from Tim's Toolbox.



Figure 1-14 Keyboard and mouse



Figure 1-15 Monitor



Figure 1-16 A 3½-inch floppy disk



Figure 1-17 An optical disk

- **Communication:** At one time, it was uncommon for a microcomputer system to communicate with other computer systems. Now, using **communication devices**, a microcomputer can communicate with other computer systems located as near as the next office or as far as halfway around the world using the Internet. The most widely used communication device is a **modem**, which modifies telephone communications into a form that can be processed by a computer. Modems also modify computer output into a form that can be transmitted across standard telephone lines.

Concept Check

- ✓ What are the four types of computers?
- ✓ Describe the four types of microcomputers.
- ✓ Describe the four basic categories of microcomputer hardware.

DATA

Data are unprocessed facts. Processing data creates information. Four common file types are document, worksheet, database, and presentation.

Data are raw, unprocessed facts, including text, numbers, images, and sounds. As we have mentioned earlier, processed data becomes information. When stored electronically in files, data can be used directly as input for the information system.

Four common types of files (see Figure 1-18) are:

- **Document files**, created by word processors to save documents such as memos, term papers, and letters.
- **Worksheet files**, created by electronic spreadsheets to analyze things like budgets and to predict sales.
- **Database files**, typically created by database management programs to contain highly structured and organized data. For example, an employee database file might contain all the workers' names, social security numbers, job titles, and other related pieces of information.
- **Presentation files**, created by presentation graphics programs to save presentation materials. For example, a file might contain audience handouts, speaker notes, and electronic slides.

Concept Check

- ✓ Define data.
- ✓ What is the difference between data and information?
- ✓ List four common types of files.

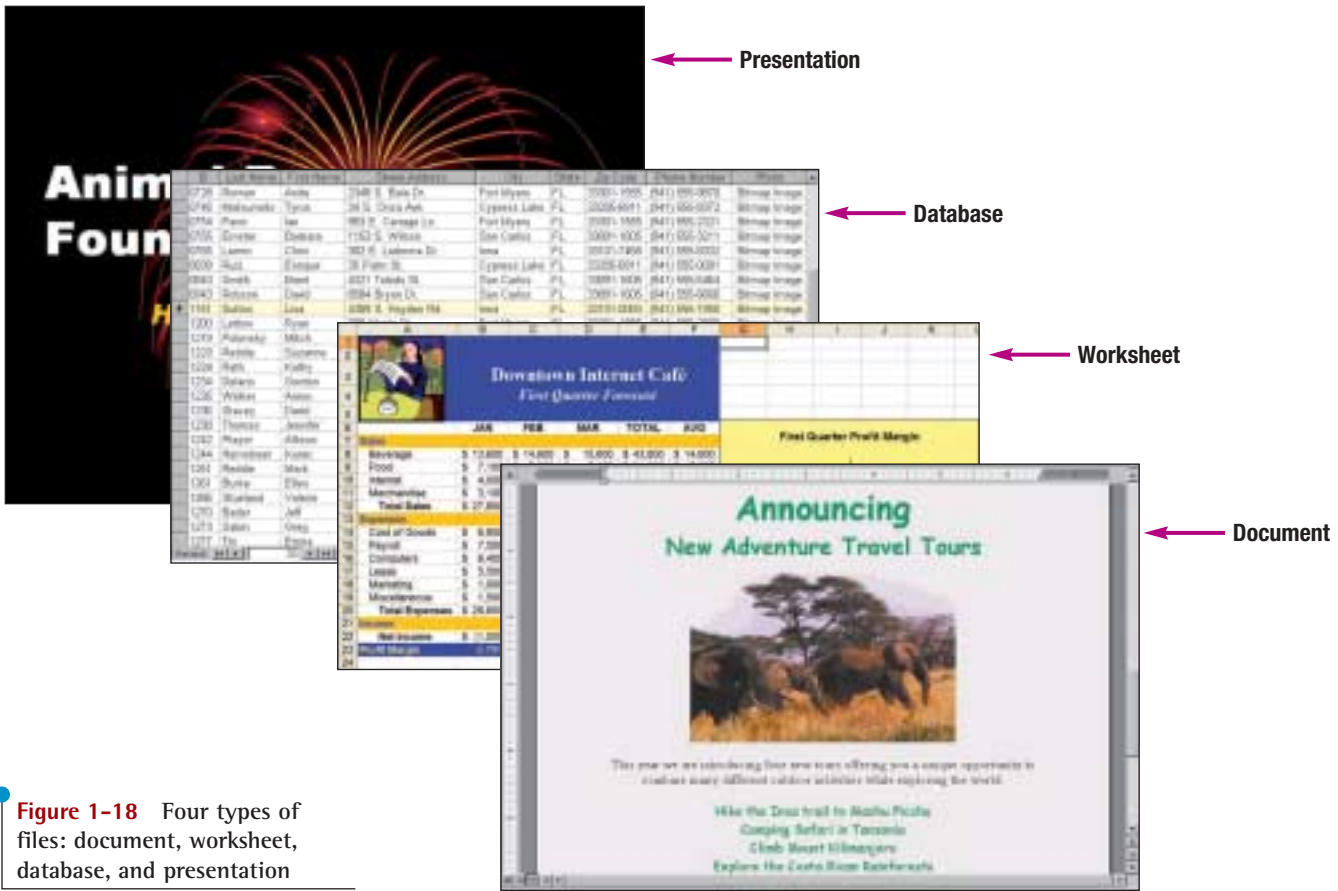


Figure 1-18 Four types of files: document, worksheet, database, and presentation

CONNECTIVITY, THE WIRELESS REVOLUTION, AND THE INTERNET

Connectivity allows sharing of information worldwide. The wireless revolution is expected to alter communications and computer systems. The Internet is the largest network in the world.

Connectivity is the capability of your microcomputer to share information with other computers. Data and information can be sent over telephone lines or cable and through the air. Thus, your microcomputer can be connected to other computers, to the Internet, and to many computerized data banks and other sources of information worldwide.

The single most dramatic change in connectivity in the past five years has been the widespread use of mobile or wireless communication devices. Once used exclusively for telephone communications, these devices are now widely used to connect people and computers located almost anywhere in the world. For just a few of these devices, see Figure 1-19. Many experts predict that these wireless applications are just the beginning of the **wireless revolution**, a revolution that is expected to dramatically affect the way we communicate and use computer technology.



Figure 1-19 Wireless communication devices

Connectivity and the wireless revolution are significant developments, for they expand the uses of the microcomputer severalfold. Central to the concept of connectivity is the **network** or **computer network**. A network is a communications system connecting two or more computers. Networks connect people as close as the next office and as far away as halfway around the world.

The largest network in the world is the **Internet**. It is like a giant highway that connects you to millions of other people and organizations located throughout the world. (See Figure 1-20.) The Internet is a huge computer network available to nearly everyone with a microcomputer and a means to connect to it. The **Web**, also known as the **World Wide Web** or **WWW**, provides a multimedia interface to the numerous resources available on the Internet.

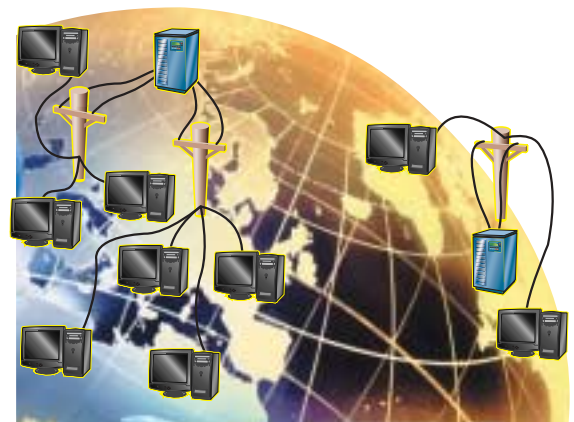


Figure 1-20 The Internet connects millions of people and computers worldwide

Concept Check

- ✓ Define connectivity and the wireless revolution.
- ✓ What is a network?
- ✓ What is the Internet?



Careers in IT

Some of the fastest growing career opportunities are in information technology. Every chapter following this chapter includes a detailed job description for a different career in IT. These descriptions, include job titles, responsibilities, educational requirements, and

salary ranges. For a list of just a few of these careers, see Figure 1-21. For a complete list and full descriptions, visit our site at <http://www.mhhe.com/oleary/CT05> and select Careers in IT from Tim's Toolbox.

Webmasters develop and maintain Web sites and Web resources. Webmasters also monitor and initiate steps to increase the traffic at Web sites. Salaries range from \$45,000 to \$70,000. See page XX for details.

Software engineers analyze users' needs and create application software. They have a background in programming and focus on the design and development of programs. Salaries range from \$50,000 to \$85,000. See page XX for details.

Database administrators use specialized database management software to determine the most efficient ways to organize and access a company's data. Additionally, they are responsible for maintaining database security and backing up the corporate databases. Salaries range from \$35,000 to \$75,000. See page XX for details.

Systems analysts address specific organization needs for information. Working with end users and other computer professionals, they follow the steps in the systems life cycle which includes preliminary investigation, analysis, design, development, implementation, and maintenance. Salaries range from \$35,000 to \$70,000. See page XX for details.

Computer programmers create, test, and troubleshoot programs used by computers. Most programmers work for companies that create and sell software, but programmers may also be employed in various other businesses. Salaries range from \$45,000 to \$75,000. See page XX for details.

Figure 1-21 Select Careers in IT

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A Look to the Future

Using and Understanding Information Technology Means Being Computer Competent and Knowledgeable

The purpose of this book is to help you use and understand information technology. We want to help you become computer competent in today's world and to provide you a foundation of knowledge so that you can understand how technology is being used today and anticipate how technology will be used in the future. This will enable you

to benefit from four important information technology developments: the ever evolving Internet and Web, more powerful software, more powerful hardware, and organizational use of computers.



THE INTERNET AND THE WEB
The Internet and the Web are considered by most to be the two most important technologies for the 21st century. Understanding how to efficiently and effectively use the Internet to browse the Web, communicate with others, and locate information are indispensable computer

competencies. Understanding how the Internet and the Web work provides a foundation to appreciate their positive aspects such as the enormous potential of electronic commerce. These issues are presented in Chapter 2, The Internet, the Web, and Electronic Commerce.

POWERFUL SOFTWARE

The software now available can do an extraordinary number of tasks and help you in an endless number of ways. You can create professional looking documents, analyze massive amounts of data, create dynamic multimedia Web pages, and much more. Today's employers are expecting the people they hire to be able to effectively and efficiently use a variety of different types of software. General-purpose and special-purpose applications are presented in Chapters 3 and 4. System software is presented in Chapter 5.

POWERFUL HARDWARE

Microcomputers are now much more powerful than they used to be. Indeed, the newer models have the speed and power of room-size computers of only a few years ago. New communication technologies such as wireless networks are dramatically changing the ways to connect to other computers, networks, and the Internet. However, despite the rapid change of specific equipment, their essential features remain unchanged. Thus, the competent and knowledgeable end user should focus on these features. Chapters 6 through 10 explain what you need to know about hardware: the central processing unit, input, output, secondary storage, and communication. A Buyer's Guide and an Upgrader's Guide are presented at the end of this book for those considering the purchase or upgrade of a microcomputer system.

SECURITY AND PRIVACY

What about people? Is there a downside to all these technological advances? Experts agree that we as a society must be careful about the potential of technology to negatively impact our personal privacy and security. Additionally, we need to be aware of potential physical and mental health risks associated with using technology. Finally, we need to be aware of negative effects on our environment caused by the manufacture of computer-related products. Thus, Chapter 11 explores each of these critical issues in detail.

ORGANIZATIONS

Almost all organizations rely on the quality and flexibility of their information systems to stay competitive. As a member or employee of an organization, you will

undoubtedly be involved in these information systems. Therefore, you need to be knowledgeable about the different types of organizational information systems and how they are used. Accordingly, we devote Chapters 12 through 15 to detail what you need to know about information systems and how to develop, modify, and maintain these systems.

CHANGING TIMES

Are the times changing any faster now than they ever have? Most people think so. Those who were alive when radios, cars, and airplanes were being introduced certainly lived through some dramatic changes. Has technology made our own times even more dynamic? Whatever the answer, it is clear we live in a fast-paced age. The Evolution of the Computer Age section presented at the end of this book tracks the major developments since computers were first introduced.

Most people and businesses have become aware that they must adapt to changing technology or be left behind. Almost all major organizations have plans to keep track of technology and to use it in their competitive strategies. Nearly every corporation in the world has a presence on the Internet. Delivery services such as Federal Express and UPS provide customers with the ability to personally track the delivery of their packages. Retail stores such as JCPenney and Walmart provide catalog support and sales. Banks such as Wells Fargo and Citibank support home banking and electronic commerce. You can even purchase tickets to music, theater, and sporting events on the Internet.

Clearly, such changes do away with some jobs—those of many bank tellers and cashiers, for example. However, they create opportunities for other people. New technology requires people who are truly capable of working with it. These are not the people who think every piece of equipment is so simple they can just turn it on and use it. Nor are they those who think each new machine is a potential disaster. In other words, new technology needs people who are not afraid to learn about it and who are able to manage it. The real issue, then, is not how to make technology better. Rather, it is how to integrate the technology with people. In Chapter 16 we discuss these issues, your future, and information technology.

After reading this book, you will be in a very favorable position compared with many other people in industry today. You will learn not only the basics of hardware, software, connectivity, the Internet, and the Web—you will also learn the most current technology. You will be able to use these tools to your advantage—to be a winner.

INFORMATION TECHNOLOGY, THE INTERNET, AND YOU

INFORMATION SYSTEMS



The way to think about a microcomputer is to realize that it is one part of an **information system**. Five parts of an information system:

1. **People** are obviously the essential part of the system! The purpose of information systems is to make people, or **end users** like you, more productive.
2. **Procedures** are rules or guidelines to follow when using software, hardware, and data. They are typically documented in manuals written by computer professionals.
3. **Software (programs)** provides step-by-step instructions to control the computer to convert data into information.
4. **Hardware** consists of the physical equipment. It is controlled by software and processes data to create information.
5. **Data** consists of unprocessed facts including text, numbers, images, and sound. **Information** is data that has been processed by the computer.

Connectivity is an additional part to today's information systems. It allows computers to connect and share information. To be **computer competent** and **knowledgeable**, end users need to understand **information technology (IT)**.

PEOPLE



People are the most important part of an information system. People are touched hundreds of times daily by computers. This book contains several features to demonstrate how people just like you use computers. These features include:

- **Making IT Work for You** presents several interesting and practical applications. Topics include creating personal Web sites, using digital photography, and searching for job opportunities.
- **Tips** offer a variety of suggestions on such practical matters as how to improve slow computer performance and how to protect your privacy while on the Web.
- **Interactive CDs** included with this book are **SimNet Concepts** and **Computing Today CD**. These CDs provide tutorials, animations, videos, and in-depth coverage of select topics.



To prepare for your future as a competent and knowledgeable end user, you need to understand the basic parts of an information system: people, procedures, software, hardware, and data. Also you need to understand connectivity through the Internet and the Web and to recognize the role of technology in your professional and personal life.

SOFTWARE



Software, or **programs**, consists of system and application software.

System Software

System software enables application software to interact with computer hardware. It consists of a variety of programs including:

- **Operating systems** coordinate resources, provide an interface for users and computer hardware, and run applications. Windows XP and Mac OS X are operating systems.
- **Utilities (service programs)** perform specific tasks to manage computer resources.
- **Device drivers** are specialized programs to allow input and output devices to communicate with the rest of the computer system.

Application Software

Application software includes general and special-purpose applications. **General-purpose (basic applications)** are widely used in nearly all career areas.

Special-purpose applications (advance applications) focus on specific disciplines and occupations. These programs include **graphics, audio and video, multimedia, Web authoring, and artificial intelligence** programs.

HARDWARE



Hardware is the physical equipment in an information system.

Types of Computers

Supercomputer, mainframe, minicomputer (midrange), and microcomputer are four types of computers. Microcomputers can be **desktop, notebook (laptop), tablet PC, or handheld (palm)**. PDAs are the most widely used handheld computer.

Microcomputer Hardware

There are four basic categories of hardware devices:

- **System unit (system cabinet or chassis)** contains the electronic circuitry, including the **microprocessor** and **memory (primary storage, random access memory, RAM, temporary storage)**.
- **Input/output devices** are translators between humans and computers. **Input devices** include **keyboard** and **mouse**. **Output devices** include **monitors (video display screens)** and **printers**.
- **Secondary storage devices** store data and programs. Typical media include **floppy, hard, and optical disks (CD and DVD)**.
- **Communication devices** connect the system unit to other computers and the Internet. A **modem** modifies signals for processing and communication.

DATA

Data describe and are the raw facts about something. Common file types include:

- **Document files** created by word processors.



- **Worksheet files** created by spreadsheet programs.



- **Database files** created by database management programs.



- **Presentation files** created by presentation graphics programs.



CONNECTIVITY AND THE INTERNET

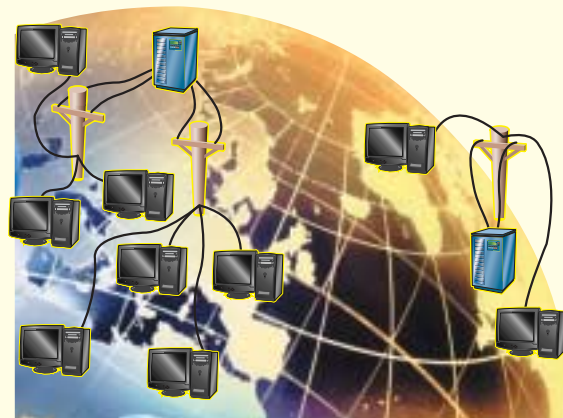
Connectivity

Connectivity is a concept describing the ability of end users to tap into resources well beyond their desktops. **Computer networks (networks)** are connected computers that share data and resources.



The Wireless Revolution

The **wireless revolution** is the widespread and increasing use of mobile (wireless) communication devices.



Internet

The **Internet** is the world's largest computer network. The **Web**, also known as the **World Wide Web (WWW)**, provides a multimedia interface to resources available on the Internet.

KEY TERMS

- advanced application (10)
- application software (9)
- basic application (9)
- chassis (13)
- communication device (15)
- compact disc (CD) (14)
- computer competency (3)
- computer knowledge (3)
- computer network (17)
- Computing Today CD (8)
- connectivity (5)
- data (5)
- database file (15)
- device driver (9)
- desktop computer (12)
- digital versatile disc (DVD) (14)
- digital video disc (DVD) (14)
- document file (15)
- end user (4)
- floppy disk (14)
- general-purpose application (9)
- handheld computer (12)
- hard disk (14)
- hardware (5)
- information (4)
- information system (4)
- information technology (IT) (5)
- input device (14)
- Internet (17)
- keyboard (14)
- laptop computer (12)
- mainframe computer (11)
- memory (14)
- microcomputer (12)
- microprocessor (14)
- midrange computer (12)
- minicomputer (12)
- modem (15)
- monitor (14)
- mouse (14)
- network (17)
- notebook computer (12)
- operating system (9)
- optical disk (14)
- output device (14)
- palm computer (12)
- people (4)
- personal digital assistant (PDA) (12)
- presentation file (15)
- primary storage (14)
- printer (14)
- procedures (4)
- program (4)
- random access memory (RAM) (14)
- secondary storage device (14)
- service program (9)
- software (4)
- special-purpose application (10)
- supercomputer (11)
- SimNet Concepts (8)
- system cabinet (13)
- system software (9)
- system unit (13)
- tablet PC (12)
- temporary storage (14)
- utility (9)
- video display screen (14)
- Web (17)
- wireless revolution (16)
- worksheet file (15)
- World Wide Web (WWW) (17)

To test your knowledge of these key terms with animated flash cards, select Flash Cards from Tim's Toolbox at <http://www.mhhe.com/oleary/CT05>.

CHAPTER REVIEW

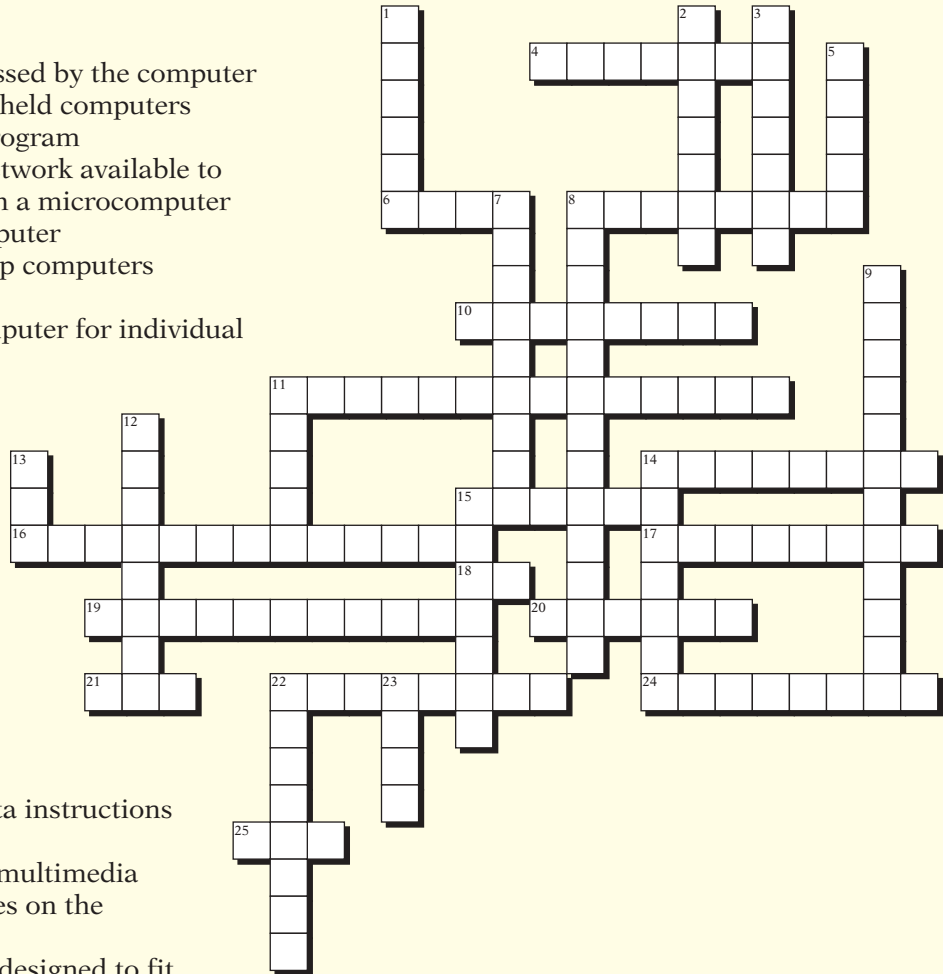
CROSSWORD

ACROSS

- 4 Displays data processed by the computer
- 6 Also known as handheld computers
- 8 Another word for program
- 10 A huge computer network available to nearly everyone with a microcomputer
- 11 CPU of a microcomputer
- 14 Also known as laptop computers
- 15 End users
- 16 Small, low-cost computer for individual users
- 17 Is a type of notebook computer that accepts handwritten input
- 18 Computer systems large or micro that provide understanding to the end user
- 19 Data that has been processed by a computer system
- 20 Holding area for data instructions and information
- 21 A service providing multimedia interface to resources on the Internet
- 22 Computers that are designed to fit into the palm
- 24 Input device
- 25 Internet service using hypertext

DOWN

- 1 Computer that is portable and fits into most briefcases
- 2 Also known as a service program, manages computer resources
- 3 Instructions for the computer to follow in order to process data
- 5 Device that rolls and directs the cursor
- 7 Can process several million program instructions per second
- 8 Fastest calculating device
- 9 Desk-sized computer between micro and mainframe
- 11 Short for modulator-demodulator
- 12 Also known as minicomputer
- 13 Volatile temporary storage
- 14 Arrangement in which various communications channels are connected
- 15 Device that produces printed-paper output
- 22 The equipment that processes the data to create information
- 23 Raw unprocessed facts



Interactive crossword puzzles are available by selecting Crosswords from Tim's Toolbox at <http://www.mhhe.com/oleary/CT05>.

MULTIPLE CHOICE

Circle the letter or fill in the correct answer.

- Computer _____ refers to acquiring computer related skills.
 - competency
 - aware
 - connectivity
 - networked
 - active
- The _____ consist(s) of the equipment: keyboard, mouse, monitor, system unit, and other devices.
 - people
 - procedures
 - hardware
 - system unit
 - information
- The _____ is one of the system software programs.
 - word processor
 - database management system
 - operating system
 - application software
 - information system
- Browsers, word processors, and spreadsheets are _____ applications.
 - special-purpose
 - general-purpose
 - advanced
 - artificial intelligence
 - multimedia
- A _____ computer is another name for a notebook computer.
 - PDA
 - laptop
 - midrange
 - DVD
 - handheld
- _____ is sometimes referred to as temporary storage.
 - PDA
 - CD
 - RAM
 - DVD
 - Secondary storage
- The type of disk that uses laser technology:
 - concentric
 - layered
 - hard
 - floppy
 - optical
- A _____ file might contain audience handouts, speaker notes, and electronic slides.
 - document
 - database
 - worksheet
 - presentation
 - floppy disk
- The term _____ refers to the widespread use of mobile communication devices.
 - IT
 - wireless revolution
 - PDA
 - RAM
 - WWW
- The largest network in the world is called the _____.
 - Internet
 - WWW
 - World Wide Web
 - Web
 - all of the above

To test your knowledge of this chapter, select Self Test from Tim's Toolbox at

<http://www.mhhe.com/oleary/CT05>.

MATCHING

Match each numbered item with the most closely related lettered item. Write your answers in the spaces provided.

- | | |
|-----------------------------|--|
| a. application software | 1. Guidelines for people to follow when using software, hardware, and data. _____ |
| b. computer network | 2. Consists of the step-by-step instructions that tell the computer how to do its work. _____ |
| c. connectivity | 3. Although not the most powerful, this type of computer is capable of great processing speeds and data storage. _____ |
| d. database files | 4. The capability of a microcomputer to share information with other computers. _____ |
| e. document file | 5. Software that enables the application software to interact with the computer hardware. _____ |
| f. hard disks | 6. End user software. _____ |
| g. information | 7. The most powerful type of computer. _____ |
| h. input device | 8. Data that has been processed through the computer. _____ |
| i. mainframe computer | 9. Translates processed information from the computer into a form that humans can understand. _____ |
| j. microcomputers | 10. Container that houses most of the electronic components that make up a computer system. _____ |
| k. optical disks | 11. The least powerful and most widely used type of computer. _____ |
| l. output device | 12. Translates data and programs that humans can understand into a form that the computer can process. _____ |
| m. primary storage | 13. Created by database management programs. _____ |
| n. procedures | 14. Holds data and programs even after electrical power to the system has been turned off. _____ |
| o. program | 15. Typically used to store programs and very large data files. _____ |
| p. secondary storage device | 16. Use laser technology and have the greatest capacity of all secondary storage. _____ |
| q. supercomputers | 17. Created by word processors to save documents. _____ |
| r. system software | 18. Holds data and program instructions for processing data. _____ |
| s. system unit | 19. Communications system connecting two or more computers. _____ |
| t. the Internet | 20. The largest network in the world. _____ |

OPEN-ENDED

On a separate sheet of paper, respond to each question or statement.

1. Explain the five parts of an information system. What part do people play in this system?
2. What is system software? What kinds of programs are included in system software? What is the difference between system software and application software? What are the most common basic applications?
3. Define and compare general-purpose and special-purpose application software. Describe some different types of general-purpose applications. Describe some types of special-purpose applications.
4. Describe the different types of computers. What is the most common type? What are the types of microcomputers?
5. What is connectivity? How are the wireless revolution and connectivity related? What is a computer network? What are the Internet and the Web?

2

In each of the following chapters, questions in Using Technology focus on interesting applications of technology that relate directly to you. Some of those applications are listed below. Select the two that you find the most interesting and then describe why they are of interest to you and how you might use (or, are using) those applications.

- **Online Auctions** Have you ever participated in an online auction? You can purchase or sell all types of goods from baseball cards to used and new automobiles. What are some of the pros and cons? How can you protect yourself as a buyer and as a seller? See page X.
- **Online Personal Information Manager** Do you have a PDA? Many people do and they have become very dependent on them to record personal schedules, addresses, telephone numbers, e-mail addresses, and much more. What if the PDA gets lost? One way to protect yourself is to back up the information onto another computer. Or, you could use an online personal information manager. See page X.
- **Utility Suites** Are you concerned about keeping your computer tuned up and safe from computer viruses? Most of us are and all of us should be. One way to keep your system operating smoothly and safely is to use a utility suite. McAfee and Symantec are producers of two well-known utility suites. See page X.
- **Desktop and Notebook Computers** Are you thinking about buying a new computer? Would you prefer a desktop or notebook? Perhaps you are considering a tablet PC or a handheld computer. The Web is an excellent resource for reviewing, comparing, and purchasing computers. See page X.
- **TiVo** Would you like to avoid the hassles and limitations of your video tape recorder? TiVo is a device that automatically will record television programs digitally. It allows you to pause a live television broadcast, view slow motion, and much more. See page X.
- **Anonymous Web Browsing** Have you ever wanted to send an e-mail message to someone without them knowing where it came from? Did you know that your activities on the Web can be traced? The Anonymizer can change all that and more. See page X.



EXPANDING YOUR KNOWLEDGE



1



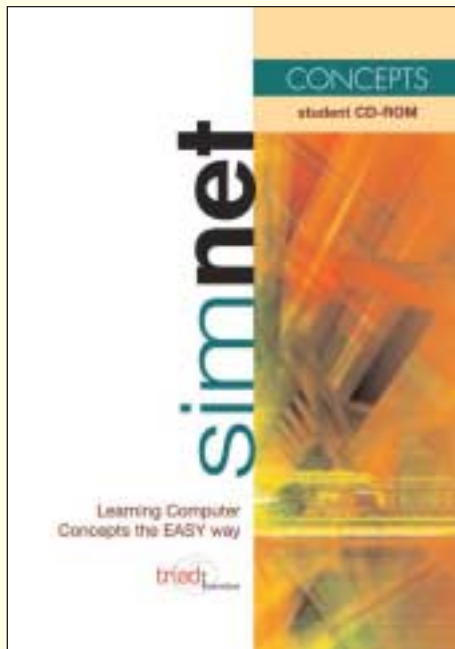
A deeper knowledge of select topics can greatly enhance your understanding of information technology. In each of the following chapters, the Expanding Your Knowledge feature presents four questions designed to help you gain a deeper understanding of select topics.

Typically, one question in Expanding Your Knowledge relates to a topic contained on your **Computing Today CD**. Some of those topics are listed below. Select the two that you find the most interesting and then describe why they are of interest to you and why they are important.

- **How Instant Messaging Works** One of the fastest growing applications on the Internet is instant messaging. This extension to e-mail provides a way for friends and colleagues to communicate and share information from almost anywhere in the world. See page xx.
- **How Web-based Applications Work** Some predict that many organizations will be using Web-based applications in the near future. These organizations will not be required to own, install, upgrade, or store applications. Additionally, applications and application files can be accessed from almost anywhere in the world. See page xx.
- **How Web Site Development Works** Developing or publishing a Web site is a common activity for organizations of all types and for people from all walks of life. The process of creating a Web site consists of five steps: planning, analyzing and designing, creating, going online, and maintaining. See page xx.
- **How Computer Viruses Work** Computer viruses are destructive and dangerous programs that can migrate through networks and operating systems. They often attach themselves to other programs, e-mail messages, and databases. It is essential to protect your computer systems from computer viruses. See page xx.
- **How Digital Photography Works** While traditional cameras capture images on film, digital cameras capture images, and convert them into a digital form. These images can be viewed immediately and saved to a disk or into the cameras memory. See page xx.
- **How Internet Telephones Work** Internet telephones offer a low cost alternative to making long distance calls. Using the Internet telephone (or other appropriate audio input and output devices), the Internet, a special service provider, a sound card, and special software you can place long distance calls to almost anywhere in the world. See page xx.
- **How Wireless Networks Work** Wireless home networks are becoming very popular. These LANs are easy to set up and use. They allow different computers to share resources including a common Internet connection and printer. See page xx.

EXPANDING YOUR KNOWLEDGE

2



In each of the following chapters, one question in Expanding Your Knowledge typically relates to a tutorial on your SimNet CD. Some of those tutorials are listed below. Select the two that you find the most interesting and then describe why they are of interest to you and why they are important.

- **The Internet, Web, and Electronic Commerce** Internet service providers, Web browsers, Web pages, HTML, e-mail, electronic commerce, and more are presented in this tutorial. See page XX.
- **Applications Software** This tutorial presents browsers, word processors, spreadsheets, database administrators, presentation graphics, and more. See page XX.
- **System Software** This tutorial describes the Windows operating systems and commonly used Windows utilities. Other operating systems are presented including Mac OS. See page XX.
- **The System Unit** This tutorial describes components within the system unit including the motherboard, CPU, memory, expansion boards, and expansion cards. See page X.
- **Input and Output** This tutorial describes keyboards, mice, digital cameras, monitors, printers, plotters and more. See page XX.
- **Secondary Storage** Removable and nonremovable disks are presented in this tutorial. Also, CDs are compared to DVDs. See page X.
- **Connectivity, the Wireless Revolution, and Communications** This tutorial presents connectivity concepts, Web sites specifically designed for wireless handheld devices, and different network configurations. See page X.
- **Privacy and Security** A variety of ergonomic, privacy, and security issues are presented. The most significant security risks for end users are discussed. See page XX.



BUILDING YOUR PORTFOLIO



1



A portfolio typically consists of printed material that documents an individual's skills and knowledge. The process of creating a portfolio helps individuals to recognize and to organize their accomplishments. A well-designed and complete portfolio can be an essential tool for landing that perfect job. In the following chapters, the Building Your Portfolio feature presents four questions designed to help you create a portfolio to document your computer competency and knowledge.

Two questions in Building Your Portfolio typically relate to key technologies. Some of these technologies are listed below. Select the two that you find the most interesting and then describe why they are of interest to you and why a prospective employer would be impressed with this knowledge.

- **Electronic Commerce** Electronic commerce is one of the most exciting Web applications. Different types include businesses to consumer (B2C), consumer to consumer (C2C), and business to business (B2B). Each of these has significant economic potential for nearly all organizations. See page X.
- **Artificial Intelligence** A technology that promises widespread implications is artificial intelligence. This technology attempts to simulate human senses, thought processes, and actions. Many software manufacturing companies are producing programs with built-in artificial intelligence. See page X.
- **Linux** Linux is a powerful operating system used by many computer professionals today. Some experts project that it will replace Windows as the most widely used operating system for powerful microcomputers and servers on the Web. See page X.
- **Microprocessors** One of the most important components of any microcomputer systems is the microprocessor. For the past several years, microprocessor speeds have doubled every year and a half. Many manufacturers including Intel, AMD, and Cyrix expect this trend to continue. See page X.
- **Digital Input** Before any type of data or information can be processed by a computer, it must be in digital form. The capability of input devices to convert handwriting, sketches, and images into a digital form has greatly expanded computer capabilities. See page X.

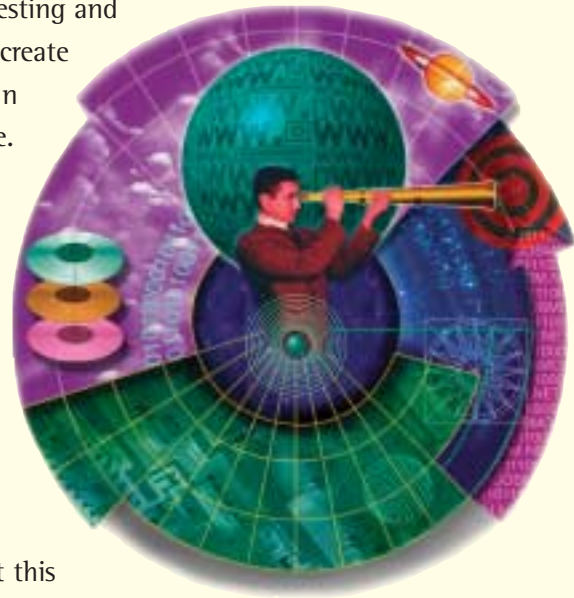


BUILDING YOUR PORTFOLIO

2

In each of the following chapters, two questions in Building Your Portfolio typically relate to security, privacy, and ethical issues. Some of these issues are listed below. Select the two that you find the most interesting and then describe why they are of interest to you and why they are important issues.

- **HTML Source Code** A common way to create interesting and dynamic Web pages is to examine how professionals create their sites. Once connected to most Web sites, you can display the HTML source code used to create that site. Additionally, you can make a copy of the code and save it on your computer system. Some argue that this is unethical and illegal. Others argue that this is an acceptable way to create personal and professional sites. See page X.
- **Antitrust** Microsoft Corporation has been involved with extensive antitrust legal battles over the past few years. The issue has been that Microsoft's Windows operating system has been tailored to use Microsoft application software. The suite claims that this provides Microsoft an unfair advantage over other companies that produce competing application software. While many support this view, others contend that all corporations use whatever they can to improve their competitive positions. See page X.
- **Processor Serial Numbers** When the Intel Pentium III microprocessor was released, each unit originally contained a unique Processor Serial Number, or PSN. This PSN could be used by online e-commerce sites to identify and track individuals by the computer they used. This tracking would be similar to keeping track of car owners by their license plate numbers. Intel anticipated that the PSN would help electronic commerce and add security to Internet sales. Others argued that the tracking capabilities were an invasion of personal privacy. Soon after introduction, the PSNs were discontinued. See page X.
- **CD-R and Music Files** For the past few years, one of the most popular Web activities has been to share or download music from the Web to create custom CDs. Even though recent legal rulings support the illegality of reproducing music that has been copyrighted, sharing music continues to be a widely practiced Web activity. While some suggest that stronger enforcement is needed, others suggest that enforcement is impossible and not needed. See page X.
- **Electronic Monitoring** Surveillance of individuals is greater today than ever before. For example, the FBI has proposed the widespread use of a technology known as Carnivore to help them track terrorists. This technology supports widespread monitoring of individual Internet activity and e-mail. Privacy advocates claim that this would be an unnecessary and unneeded invasion of personal privacy. See page X.



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