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COURSE TECHNOLOGY

SHELLY CASHMAN SERIES®

Discovering Computers

Fundamentals
Fourth Edition

Shelly
Cashman
Vermaat

Discovering Computers

**Fundamentals
Fourth Edition**



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CHAPTER 1

Introduction to Computers



OBJECTIVES

After completing this chapter, you will be able to:

1. Recognize the importance of computer literacy
2. Identify the components of a computer
3. Discuss the uses of the Internet and World Wide Web
4. Identify the categories of software
5. Describe the categories of computers
6. Identify the types of computer users
7. Discuss various computer applications in society

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Advantages and Disadvantages of Using Computers
Information Processing Cycle

THE COMPONENTS OF A COMPUTER

Input Devices
Output Devices
System Unit
Storage Devices
Communications Devices

NETWORKS AND THE INTERNET

COMPUTER SOFTWARE

System Software
Application Software
Installing and Running Programs
Software Development

CATEGORIES OF COMPUTERS

PERSONAL COMPUTERS

Desktop Computers

MOBILE COMPUTERS AND MOBILE DEVICES

Notebook Computers
Mobile Devices

GAME CONSOLES

SERVERS

MAINFRAMES

SUPERCOMPUTERS

EMBEDDED COMPUTERS

EXAMPLES OF COMPUTER USAGE

Home User
Small Office/Home Office User
Mobile User
Power User
Large Business User

COMPUTER APPLICATIONS IN SOCIETY

Education
Finance
Government
Health Care
Science
Publishing
Travel
Manufacturing

CHAPTER SUMMARY

COMPANIES ON THE CUTTING EDGE

Dell
Apple Computer

TECHNOLOGY TRAILBLAZERS

Bill Gates
Anne Mulcahy

A WORLD OF COMPUTERS

Computers are everywhere: at work, at school, and at home (Figure 1-1). They are a primary means of local and global communication for billions of people. Employees correspond with clients, students with classmates and teachers, and family with friends and other family members.

Through computers, society has instant access to information from around the globe. Local and national news, weather reports, sports scores, airline schedules, telephone directories, maps and directions, job listings, credit reports, and countless forms of educational material always are accessible. From the computer, you can make a telephone call, meet new friends, share photographs and videos, relate opinions, shop, book flights, file taxes, or take a course.

In the workplace, employees use computers to create correspondence such as e-mail messages, memos, and letters; calculate payroll; track inventory; and generate invoices. Some applications such as automotive design and weather forecasting use computers to perform complex mathematical calculations. At school, teachers use computers to assist with classroom instruction. Students use computers to complete assignments and research.

People also spend hours of leisure time using a computer. They play games, listen to music or radio broadcasts, watch or compose videos and movies, read books and magazines, share stories, research genealogy, retouch photographs, and plan vacations.

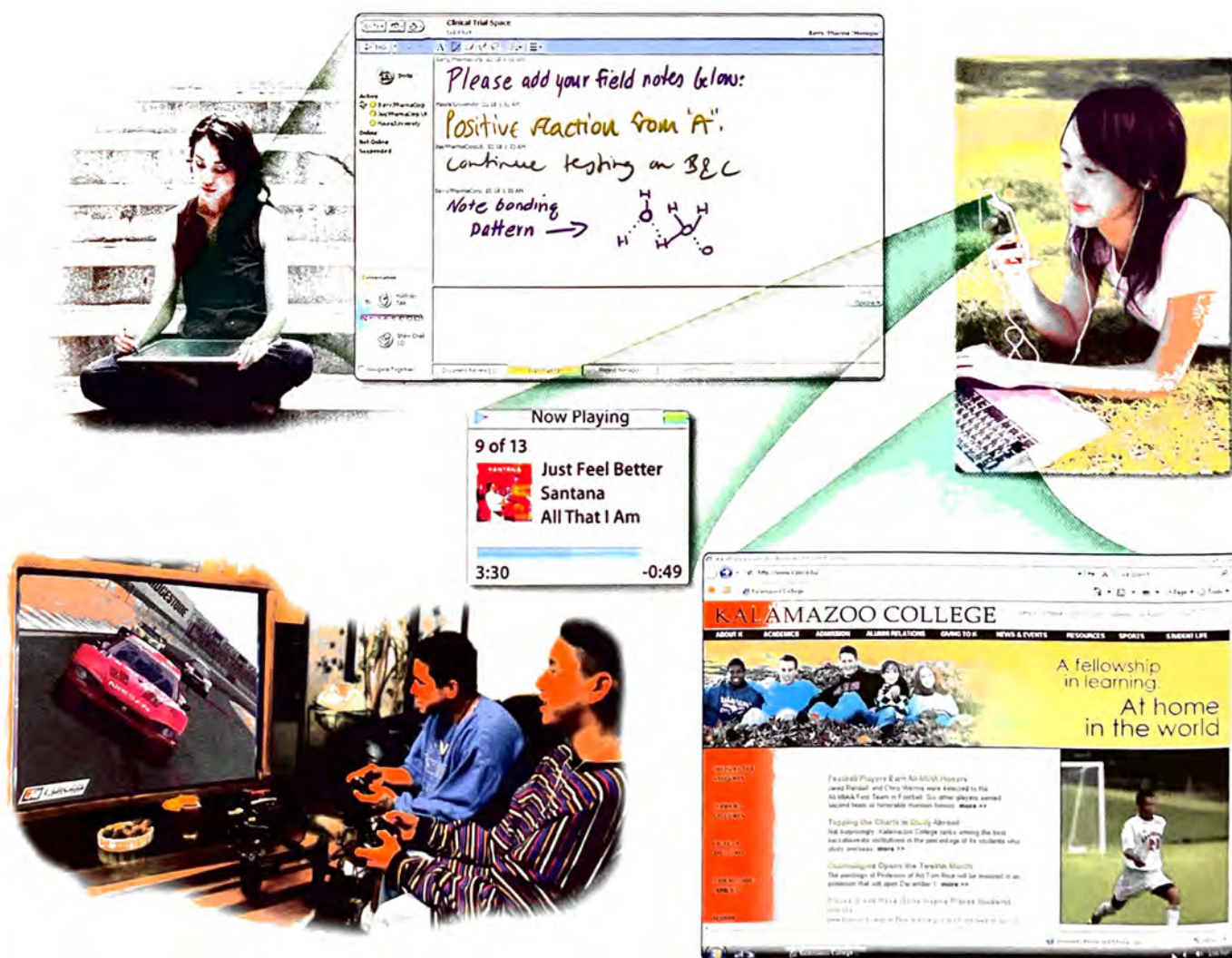


FIGURE 1-1 People use all types and sizes of computers in their daily activities.

Many people believe that computer literacy is vital to success. **Computer literacy** involves having a knowledge and understanding of computers and their uses.

This book presents the knowledge you need to be computer literate. As you read this first chapter, keep in mind it is an overview. Many of the terms and concepts introduced in this chapter will be discussed in more depth later in the book.

WHAT IS A COMPUTER?

A **computer** is an electronic device, operating under the control of instructions stored in its own memory, that can accept data, process the data according to specified rules, produce results, and store the results for future use.

Data and Information

Computers process data into information. **Data** is a collection of unprocessed items, which can include text, numbers, images, audio, and video. **Information** conveys meaning and is useful to people.



As shown in Figure 1-2, for example, computers process several data items to print information in the form of a grade report.

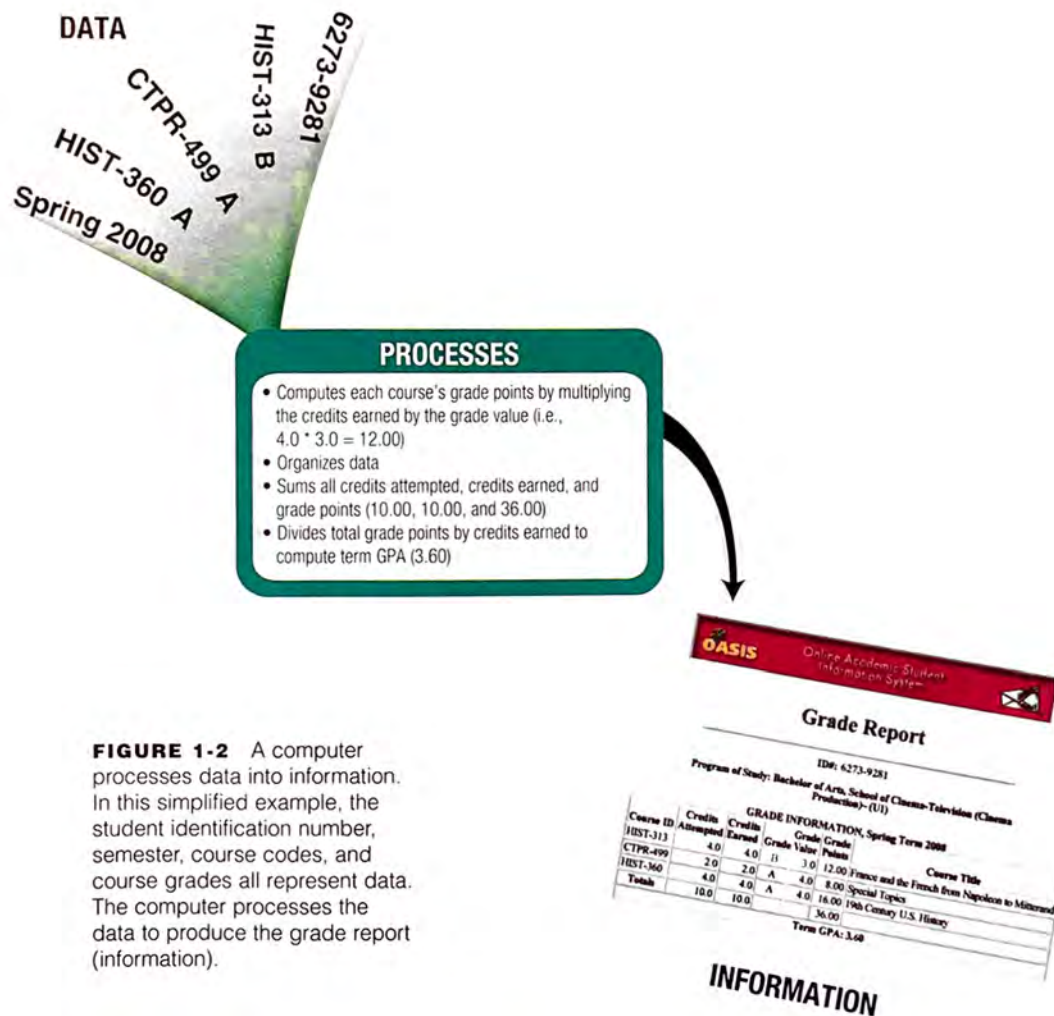


FIGURE 1-2 A computer processes data into information. In this simplified example, the student identification number, semester, course codes, and course grades all represent data. The computer processes the data to produce the grade report (information).



FAQ 1-1

Is data a singular or plural word?

The word data is plural for datum. With respect to computers, however, it is accepted and common practice to use the word data in both the singular and plural context. For more information, visit scs.site.com/pcf4e/ch1/faq and then click Data.

An **FAQ** (frequently asked question) helps you find answers to commonly asked questions. Web sites often post an FAQ section, and each chapter in this book includes FAQ boxes related to topics in the text.

Advantages and Disadvantages of Using Computers

Society has reaped many benefits from using computers. Both business and home users can make well-informed decisions because they have instant access to information from anywhere in the world. A **user** is anyone who communicates with a computer or utilizes the information it generates. Students, another type of user, have more tools to assist them in the learning process. Read Looking Ahead 1-1 for a look at the next generation of benefits from using computers.

ADVANTAGES OF USING

COMPUTERS The benefits of computers are possible because computers have the advantages of speed, reliability, consistency, storage, and communications.

- **Speed:** When data, instructions, and information flow along electronic circuits in a computer, they travel at incredibly fast speeds. Many computers process billions or trillions of operations in a single second.
- **Reliability:** The electronic components in modern computers are dependable and reliable because they rarely break or fail.
- **Consistency:** Given the same input and processes, a computer will produce the same results — consistently. Computers generate error-free results, provided the input is correct and the instructions work.
- **Storage:** Computers store enormous amounts of data and make this data available for processing anytime it is needed.
- **Communications:** Most computers today can communicate with other computers, often wirelessly. Computers allow users to communicate with one another.

DISADVANTAGES OF USING COMPUTERS Some disadvantages of computers relate to the violation of privacy, public safety, the impact on the labor force, health risks, and the impact on the environment.

- **Violation of Privacy:** In many instances, where personal and confidential records were not properly protected, individuals have found their privacy violated and identities stolen.
- **Public Safety:** Adults, teens, and children around the world are using computers to share publicly their photos, videos, journals, music, and other personal information. Some of these unsuspecting, innocent computer users have fallen victim to crimes committed by dangerous strangers.
- **Impact on Labor Force:** Although computers have improved productivity and created an entire industry with hundreds of thousands of new jobs, the skills of millions of employees have been replaced by computers. Thus, it is crucial that workers keep their education up-to-date. A separate impact on the labor force is that some companies are outsourcing jobs to foreign countries instead of keeping their homeland labor force employed.
- **Health Risks:** Prolonged or improper computer use can lead to health injuries or disorders. Computer users can protect themselves from health risks through proper workplace design, good posture while at the computer, and appropriately spaced work breaks. Another health risk, called computer addiction, occurs when someone becomes obsessed with using the computer.
- **Impact on Environment:** Computer manufacturing processes and computer waste are depleting natural resources and polluting the environment. Strategies that can help protect the environment include recycling, regulating manufacturing processes, extending the life of computers, and immediately donating replaced computers.

Information Processing Cycle

Computers process data (input) into information (output). A computer often holds data, information, and instructions in storage for future use. Instructions are the steps that tell the computer how to perform a particular task. Some people refer to the series of input, process, output, and storage activities as the **information processing cycle**. Recently, communications also has become an essential element of the information processing cycle.

LOOKING AHEAD 1-1**Medical Implants Can Enhance Lifestyles**

Cellular phone manufacturers tout their small and powerful products, but the ultimate technology is the tiny cellular-phone-on-a-chip device. By implanting this processor directly into the brain and connecting electrodes to the brain's speech center, people would have the ability to communicate on any wireless network. While this technology might seem extreme, it illustrates the emergence of electronics inside the body to improve human life.

Other possible surgeries might implant a rechargeable electrical stimulator to treat pain or muscle dysfunction or to zap the stomach or nerves with electric current to boost metabolism. A brain computer interface may monitor and treat diseases, such as epilepsy and depression, that affect brain activity. A body-scanning machine might evaluate patients' pain when they cannot communicate.

In addition, a retinal prosthesis system with a light-sensing chip implanted in the eye might help patients with degenerative retinal diseases. For more information, visit scs.site.com/dcf4e/ch1/looking and then click Computer Implants.



THE COMPONENTS OF A COMPUTER

A computer contains many electric, electronic, and mechanical components known as **hardware**. These components include input devices, output devices, a system unit, storage devices, and communications devices. Figure 1-3 shows some common computer hardware components.

Input Devices

An **input device** is any hardware component that allows you to enter data and instructions into a computer. Six widely used input devices are the keyboard, mouse, microphone, scanner, digital camera, and PC video camera (Figure 1-3).

A computer keyboard contains keys you press to enter data into the computer. A mouse is a small handheld device. With the mouse, you control movement of a small symbol on the screen, called the pointer, and you make selections from the screen.

A microphone allows a user to speak into the computer. A scanner converts printed material (such as text and pictures) into a form the computer can use.

With a digital camera, you take pictures and then transfer the photographed images to the computer or printer instead of storing the images on traditional film. A PC video camera is a digital video camera that allows users to create a movie or take still photographs electronically.

WEB LINK 1-1
Input Devices
 For more information, visit scs.site.com/pcf4e/ch1/weblink and then click Input Devices.



FIGURE 1-3 Common computer hardware components include the keyboard, mouse, microphone, scanner, digital camera, PC video camera, printer, monitor, speakers, portable media player, system unit, hard disk drive, external hard disk, USB flash drive, card reader/writer, and modem.

Output Devices

An **output device** is any hardware component that conveys information to one or more people. Four commonly used output devices are a printer, a monitor, speakers, and a portable media player (Figure 1-3).

A printer produces text and graphics on a physical medium such as paper. A monitor displays text, graphics, and videos on a screen. Speakers allow you to hear music, voice, and other audio (sounds). You can transfer audio, video, and digital images from your computer to a portable media player, and then listen to the audio, watch the video, or view the images on the media player.

WEB LINK 1-2

Output Devices

For more information, visit scs.site.com/def4e/ch1/weblink and then click Output Devices.

System Unit

The **system unit** is a case that contains electronic components of the computer that are used to process data (Figure 1-3). The circuitry of the system unit usually is part of or is connected to a circuit board called the motherboard.

Two main components on the motherboard are the processor and memory. The **processor**, also called the **central processing unit (CPU)**, is the electronic component that interprets and carries out the basic instructions that operate the computer. **Memory** consists of electronic components that store instructions waiting to be executed and data needed by those instructions. Most memory keeps data and instructions temporarily, which means its contents are erased when the computer is shut off.

Storage Devices

Storage holds data, instructions, and information for future use. For example, computers can store hundreds or millions of customer names and addresses. Storage holds these items permanently.

A computer keeps data, instructions, and information on **storage media**. Examples of storage media are USB flash drives, hard disks, CDs, DVDs, and memory cards. A **storage device** records (writes) and/or retrieves (reads) items to and from storage media. Storage devices often function as a source of input because they transfer items from storage to memory.

A USB flash drive is a portable storage device that is small and lightweight enough to be transported on a keychain or in a pocket (Figure 1-3). The average USB flash drive can hold about 500 million characters.

A hard disk provides much greater storage capacity than a USB flash drive. The average hard disk can hold more than 250 billion characters. Hard disks are enclosed in an airtight, sealed case. Although some are portable, most are housed inside the system unit (Figure 1-4). Portable hard disks are either external or removable. An external hard disk is a separate, free-standing unit, whereas you insert and remove a removable hard disk from the computer or a device connected to the computer.

A compact disc is a flat, round, portable metal disc with plastic coating. One type of compact disc is a CD-ROM, which can hold from 650 million to 1 billion characters. You can access a CD-ROM using most CD and DVD drives (Figure 1-5). Another type of compact disc is a DVD-ROM, which has enough storage capacity to store two full-length movies or 17 billion characters. To access a DVD-ROM, you need a DVD drive.

Some portable devices, such as digital cameras, use memory cards as the storage media. You can use a card reader/writer (Figure 1-3) to transfer stored items, such as digital photographs, from the memory card to a computer or printer.



FIGURE 1-4 Most hard disks are housed inside the system unit.



FIGURE 1-5 To use a CD or DVD, you need a CD or DVD drive.

WEB LINK 1-3

Communications Devices

For more information, visit scs.site.com/dcf4e/ch1/weblink and then click Communications Devices.

Communications Devices

A communications device is a hardware component that enables a computer to send (transmit) and receive data, instructions, and information to and from one or more computers. A widely used communications device is a modem (Figure 1-3 on page 6).

Communications occur over cables, telephone lines, cellular radio networks, satellites, and other transmission media. Some transmission media, such as satellites and cellular radio networks, are wireless, which means they have no physical lines or wires.

Test your knowledge of pages 2 through 8 in Quiz Yourself 1-1.



QUIZ YOURSELF 1-1

Instructions: Find the true statement below. Then, rewrite the remaining false statements so they are true.

1. A computer is a motorized device that processes output into input.
2. A storage device records (reads) and/or retrieves (writes) items to and from storage media.
3. An output device is any hardware component that allows you to enter data and instructions into a computer.
4. Computer literacy involves having a knowledge and understanding of computers and their uses.
5. Four commonly used input devices are a printer, a monitor, speakers, and a portable media player.

Quiz Yourself Online: To further check your knowledge of computer literacy and computer components, visit scs.site.com/dcf4e/ch1/quiz and then click Objectives 1 – 2.

NETWORKS AND THE INTERNET

WEB LINK 1-4

The Internet

For more information, visit scs.site.com/dcf4e/ch1/weblink and then click Internet.

A network is a collection of computers and devices connected together, often wirelessly, via communications devices and transmission media. When a computer connects to a network, it is **online**. Networks allow computers to share resources, such as hardware, software, data, and information. Sharing resources saves time and money.

The **Internet** is a worldwide collection of networks that connects millions of businesses, government agencies, educational institutions, and individuals (Figure 1-6). More than one billion people around the world use the Internet daily for a variety of reasons, including the following: to communicate with and meet other people; to access a wealth of information, news, and research findings; to shop for goods and services; to bank and invest; to take a class; to access sources of entertainment and leisure, such as online games, music, videos, books, and magazines; to download music and videos; and to share information. Figure 1-7 shows examples in each of these areas.



FIGURE 1-6 The Internet is the largest computer network, connecting millions of computers around the world.

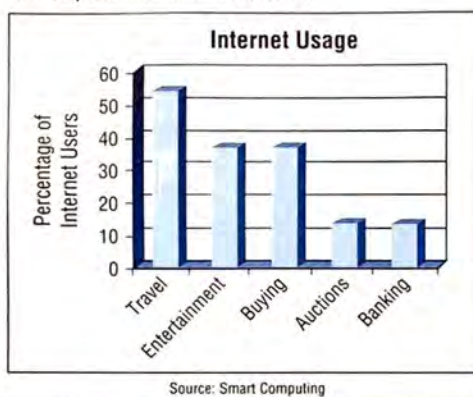


FIGURE 1-7 Users access the Internet for a variety of reasons.

FAQ 1-2

What Web sites do users visit on the Internet?

A recent survey found that users visit various types of Web sites, as shown in the chart below. For more information, visit scs.site.com/dcf4e/ch1/faq and then click Web Sites.



WEB LINK 1-5

Social Networking Web Sites

For more information, visit scs.site.com/dcf4e/ch1/weblink and then click Social Networking Web Sites.

members to share their interests, ideas, stories, photos, music, and videos with other registered users. Hundreds of thousands of people today also use blogs to publish their thoughts on the Web. A **blog** is an informal Web site consisting of time-stamped articles in a diary or journal format, usually listed in reverse chronological order. Podcasts are a popular way people verbally share information on the Web. A **podcast** is recorded audio stored on a Web site that can be downloaded to a computer or a portable media player such as an iPod.

COMPUTER SOFTWARE

Software, also called a **program**, is a series of instructions that tells the computer what to do and how to do it.

You interact with a program through its user interface. Software today often has a graphical user interface (GUI pronounced gooey), you interact with the software

using text, graphics, and visual images such as icons (Figure 1-8). An icon is a miniature image that represents a program, an instruction, or some other object. You can use the mouse to select icons that perform operations such as starting a program.

The two categories of software are system software and application software. The following sections describe these categories of software.

System Software

System software consists of the programs that control or maintain the operations of the computer and its devices. System software serves as the interface between the user, the application software, and the computer's hardware. Two types of system software are the operating system and utility programs.



FIGURE 1-8 The graphical user interface of Windows Vista.

OPERATING SYSTEM An **operating system** is a set of programs that coordinates all the activities among computer hardware devices. It provides a means for users to communicate with the computer and other software. Many of today's computers use Windows XP or Vista (Figure 1-8), two of Microsoft's operating systems, or Mac OS X, Apple's operating system.

When a user starts a computer, portions of the operating system load into memory from the computer's hard disk. It remains in memory while the computer is on.

UTILITY PROGRAM A **utility program** allows a user to perform maintenance-type tasks usually related to managing a computer, its devices, or its programs. Most operating systems include several utility programs for managing disk drives, printers, and other devices and media. You also can buy utility programs that allow you to perform additional computer management functions.

Application Software

Application software consists of programs designed to make users more productive and/or assist them with personal tasks. A widely used type of application software related to communications is a Web browser, which allows users with an Internet connection to access and view Web pages. Other popular application software includes word processing software, spreadsheet software, database software, and presentation graphics software.

Many other types of application software exist that enable users to perform a variety of tasks. These include personal information management, note taking, project management, accounting, document management, computer-aided design, desktop publishing, paint/image editing, audio and video editing, multimedia authoring, Web page authoring, personal finance, legal, tax preparation, home design/landscaping, education, reference, and entertainment (e.g., games or simulations). As shown in Figure 1-9, you often purchase application software from a store that sells computer products. Read Ethics & Issues 1-1 for a related discussion.



FIGURE 1-9 Stores that sell computer products have shelves stocked with software for sale.

ETHICS & ISSUES 1-1

Do Computer Games Do More Harm than Good?

Grand Theft Auto: San Andreas is one of today's most popular computer games. In the game, players advance through the mafia by conveying secret packages, following alleged snitches, and planting car bombs. Consumers have bought millions of copies of Grand Theft Auto. Purchasers praise the game's vivid graphics and wide range of allowable behaviors. After it was released, the game was found to contain hidden adult content accessible by using a special code. Despite investigations, the company was not fined or punished for the content. Some parents and politicians condemn the game's explicit violence and the rewards it gives players for participating in illegal acts. They fear that games like Grand Theft Auto eventually could lead to antisocial or criminal behavior. Even worse, critics fear that the game's popularity may influence future developers of computer games aimed at younger children. Despite the fears, research has shown that playing violent games has no impact on behavior or increased crime. In fact, in the time in which gaming has become popular, violent crime has decreased by 50 percent in America. Some researchers and parents note the positive aspects of gaming, such as increased dexterity for players, use of critical thinking skills to solve problems in games, meeting goals, and following rules. What impact, if any, do violent computer games or games that include unacceptable acts have on individual behavior? On balance, is computer gaming good or bad for people? Why? What other motivations might parents have who limit their children's computer gaming?

WEB LINK 1-6

Application Software

For more information, visit scs.site.com/dcf4e/ch1/weblink and then click Application Software.

Installing and Running Programs

The instructions in a program are stored on storage media such as a hard disk or compact disc. When purchasing software from a computer store, you typically receive a box that includes a CD(s) or DVD(s) that contains the program. You also may receive a manual or printed instructions explaining how to install and use the software.

Installing is the process of setting up software to work with the computer, printer, and other hardware components. When you buy a computer, it usually has some software preinstalled on its hard disk. This enables you to use the computer the first time you turn it on. To begin installing additional software from a CD or DVD, insert the program disc in a CD or DVD drive. The computer then copies the program from the disc to the computer's hard disk.

Once software is installed, you can use, or **run**, it. When you instruct the computer to run an installed program, the computer loads it, which means the program is copied from storage to memory. Once in memory, the computer can carry out, or **execute**, the instructions in the program. Figure 1-10 illustrates the steps that occur when a user installs and runs a greeting card program.

FIGURE 1-10 INSTALLING AND RUNNING A COMPUTER PROGRAM



Software Development

A programmer, sometimes called a **developer**, is someone who develops software or writes the instructions that direct the computer to process data into information. Complex programs can require thousands to millions of instructions.

Programmers use a programming language or program development tool to create computer programs. Popular programming languages include C++, Visual C#, Visual Basic, JavaScript, and Java. Figure 1-11 shows part of a JavaScript program.

```

<script src="http://www.google-analytics.com/urchin.js" type="text/javascript"></script>
<script type="text/javascript">_uacct="UA-739745-1";urchinTracker();</script>
<meta http-equiv="content-type" content="text/html; charset=iso-8859-1" />
<meta name="keywords" content="" />
<meta name="description" content="" />
<!--stopindex-->
<link rel="SHORTCUT ICON" href="http://images.pcworld.com/shared/graphics/favicon.ico" />
<script type="text/javascript" language="javascript" src="http://s.pcworld.com/script/proto"></script>
<script type="text/javascript" language="javascript" src="http://s.pcworld.com/script/main"></script>
<script type="text/javascript">
  pcw_AdInit();
  pcw_ad_site="pcw_home";
  pcw_ad_zone="home/index";
  pcw_ad_cat="";
  pcw_ad_sec="";
  pcw_ad_id="";
  pcw_AdOverride();
  // -->
</script>
<script type="text/javascript" src="http://s.pcworld.com/script/dhtmlpopup_adfloat.js"></script>
<script type="text/javascript" src="http://s.pcworld.com/script/dhtmlpopup.js"></script>
<!-- the pcw style sheet links MUST come AFTER the about styles -->
<link href="/style/main.css" rel="stylesheet" type="text/css" media="all" />
<link href="http://s.pcworld.com/style/pfv.css" rel="stylesheet" type="text/css" media="pri
</head>
<script type="text/javascript">document.write(pcw_AdRender("script","interstitial"));</script>
<!--WEBIDESTORY CODE HBX2.0 (Universal)-->
<!--COPYRIGHT WEBIDESTORY, INC. ALL RIGHTS RESERVED. U.S. PATENT NO. 6,393,479B1.
<script type="text/javascript" language="javascript">
  var _hbec=0;_hbec=new Array;function _hbec(a,b){b=_hbec[_hbec++]||new Object();b._hbec=b._hbec+1;
  var hbv=_hbecEvent("pv");hbv.vpc="HBX0200u";hbv.gn="hb.pcworld.com";

```

FIGURE 1-11 Some of the instructions in a JavaScript program.

Test your knowledge of pages 8 through 12 in Quiz Yourself 1-2.



QUIZ YOURSELF 1-2

Instructions: Find the true statement below. Then, rewrite the remaining false statements so they are true.

1. A resource is a collection of computers and devices connected together via communications devices and transmission media.
2. Installing is the process of setting up software to work with the computer, printer, and other hardware components.
3. Popular system software includes Web browsers, word processing software, spreadsheet software, database software, and presentation graphics software.
4. The Internet is one of the more popular services on the Web.
5. Two types of application software are the operating system and utility programs.

Quiz Yourself Online: To further check your knowledge of the Internet and software, visit scs.site.com/dcf4e/ch1/quiz and then click Objectives 3 – 4.

CATEGORIES OF COMPUTERS

Industry experts typically classify computers in seven categories: personal computers, mobile computers and mobile devices, game consoles, servers, mainframes, supercomputers, and embedded computers. A computer's size, speed, processing power, and price determine the category it best fits. Due to rapidly changing technology, however, the distinction among categories is not always clear-cut.

Figure 1-12 summarizes the seven categories of computers. The following pages discuss computers and devices that fall in each category.

CATEGORIES OF COMPUTERS

Category	Physical Size	Number of Simultaneously Connected Users	General Price Range
Personal computers (desktop)	Fits on a desk	Usually one (can be more if networked)	Several hundred to several thousand dollars
Mobile computers and mobile devices	Fits on your lap or in your hand	Usually one	Less than a hundred dollars to several thousand dollars
Game consoles	Small box or handheld device	One to several	Several hundred dollars or less
Servers	Small cabinet	Two to thousands	Several hundred to a million dollars
Mainframes	Partial room to a full room of equipment	Hundreds to thousands	\$300,000 to several million dollars
Supercomputers	Full room of equipment	Hundreds to thousands	\$500,000 to several billion dollars
Embedded computers	Miniature	Usually one	Embedded in the price of the product

FIGURE 1-12 This table summarizes some of the differences among the categories of computers.

PERSONAL COMPUTERS

WEB LINK 1-7
Personal Computers
 For more information, visit scs.site.com/dcf4e/ch1/weblink and then click Personal Computers.

A **personal computer** is a computer that can perform all of its input, processing, output, and storage activities by itself. A personal computer contains a processor, memory, and one or more input, output, and storage devices. They also often contain a communications device.

Two popular styles of personal computers are the PC (Figure 1-13) and the Apple (Figure 1-14). These two types of computers use different operating systems. PC and PC-compatible computers usually use a Windows operating system. Apple computers usually use a Macintosh operating system (Mac OS X). The term, PC-compatible, refers to any personal computer based on the original IBM personal computer design. Companies such as Dell, Gateway, and Toshiba sell PC-compatible computers.

Two types of personal computers are desktop computers and notebook computers.



FIGURE 1-13 The PC and PC-compatible computers usually use a Windows operating system.



FIGURE 1-14 Apple computers, such as the iMac, usually use a Macintosh operating system.

Desktop Computers

A **desktop computer** is designed so the system unit, input devices, output devices, and any other devices fit entirely on or under a desk or table. In some models, the monitor sits on top of the system unit, which is placed on the desk. The more popular style of system unit is the tall and narrow tower, which can sit on the floor vertically.

MOBILE COMPUTERS AND MOBILE DEVICES

A **mobile computer** is a personal computer you can carry from place to place. Similarly, a **mobile device** is a computing device small enough to hold in your hand. The most popular type of mobile computer is the notebook computer.

Notebook Computers

A **notebook computer**, also called a **laptop computer**, is a portable, personal computer designed to fit on your lap. Notebook computers are thin and lightweight, yet can be as powerful as the average desktop computer. Notebook computers usually are more expensive than desktop computers with equal capabilities.

On a typical notebook computer, the keyboard is on top of the system unit, and the display attaches to the system unit with hinges (Figure 1-15). These computers weigh on average between 2.5 and 9 pounds, which allows users easily to transport the computers from place to place. Most notebook computers can operate on batteries or a power supply or both.

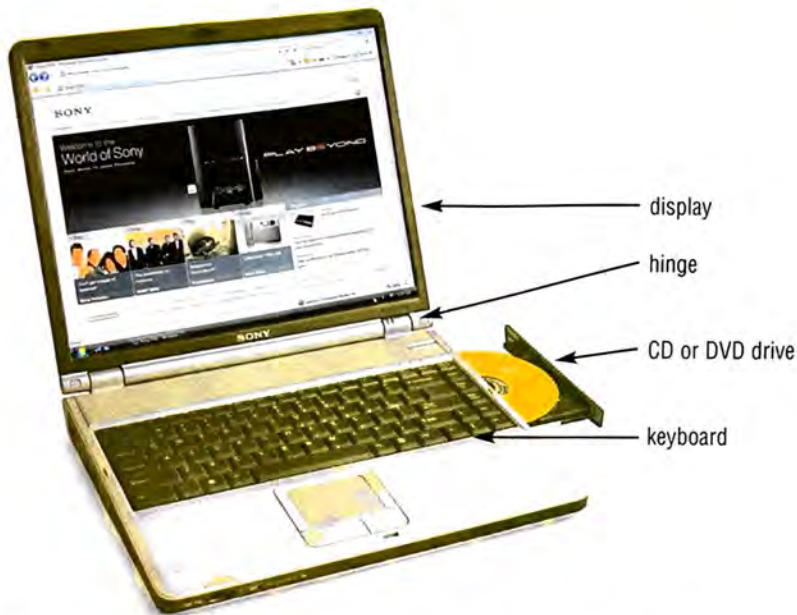


FIGURE 1-15 On a typical notebook computer, the keyboard is on top of the system unit, and the display attaches to the system unit with hinges.

TABLET PC Resembling a letter-sized slate, the **Tablet PC** is a special type of notebook computer that allows you to write or draw on the screen using a digital pen (Figure 1-16). For users who prefer typing instead of handwriting, you can attach a keyboard to Tablet PCs that do not include one already. Tablet PCs are useful especially for taking notes in locations where the standard notebook computer is not practical.

Mobile Devices

Mobile devices, which are small enough to carry in a pocket, usually store programs and data permanently on memory inside the system unit or on small storage media such as memory cards. You often can connect a mobile device to a personal computer to exchange information. Some mobile devices are **Internet-enabled**, meaning they can connect to the Internet wirelessly.

Three popular types of mobile devices are handheld computers, PDAs, and smart phones.

HANDHELD COMPUTER A **handheld computer**, sometimes referred to as an **ultra personal computer (uPC)**, or an **Ultra-Mobile PC (UMPC)**, or a **handtop computer**, is a computer small enough to fit in one hand. Because of their reduced size, the screens on handheld computers are small. Industry-specific handheld computers serve mobile employees, such as parcel delivery people, whose jobs require them to move from place to place.

PDA A **PDA (personal digital assistant)** provides personal organizer functions such as a calendar, an appointment book, an address book, a calculator, and a notepad (Figure 1-17). Most PDAs also offer a variety of other application software such as word processing, spreadsheet, personal finance, and games.

Many PDAs are Internet-enabled so users can check e-mail and access the Web. Some also provide camera and telephone capabilities.

The primary input device of a PDA is the **stylus**, which looks like a small ballpoint pen, but uses pressure instead of ink to write and draw.



FIGURE 1-16 A Tablet PC combines the features of a traditional notebook computer with the simplicity of pencil and paper.

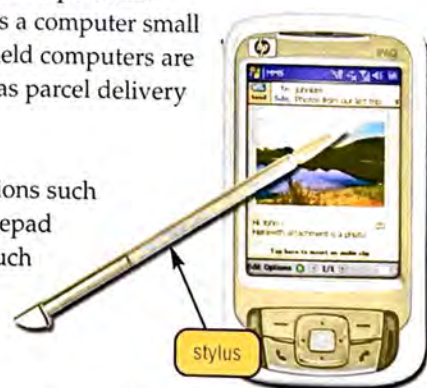


FIGURE 1-17 PDAs provide personal information management functions as well as Internet access and telephone capabilities.

SMART PHONE Offering the convenience of one-handed operation, a **smart phone** is an Internet-enabled telephone that usually also provides PDA capabilities. In addition to basic telephone capabilities, a smart phone allows you to send and receive e-mail messages, access the Web, listen to music, and share photographs or videos (Figure 1-18).

As smart phones and PDAs continue a trend of offering similar functions, it is becoming increasingly difficult to differentiate between the two devices. This trend, known as convergence, has led manufacturers to refer to PDAs and smart phones simply as **handhelds**. Some factors that affect a consumer's purchasing decision include the device's size, screen size, and capabilities of available software.

WEB LINK 1-8
Smart Phones
 For more information, visit scs.site.com/dcf4e/ch1/weblink and then click Smart Phones.



FIGURE 1-18 Smart phones allow you to check e-mail, access the Web, listen to music, and share photos and videos.

GAME CONSOLES

A **game console** is a mobile computing device designed for single-player or multiplayer video games (Figure 1-19). Standard game consoles use a handheld controller(s) as an input device(s); a television screen as an output device; and hard disks, CDs, DVDs, and/or memory cards for storage. The compact size and light weight of game consoles make them easy to use at home, in the car, in a hotel, or any location that has an electrical outlet. Three popular models are Microsoft's Xbox 360, Nintendo's Wii, and Sony's PlayStation 3.

A handheld game console is small enough to fit in one hand. With the handheld game console, the controls, screen, and speakers are built into the device. Some models use cartridges to store games; others use a miniature type of CD or DVD. Many handheld game consoles can communicate wirelessly with other similar consoles for multiplayer gaming. Two popular models are Nintendo DS Lite and Sony's PlayStation Portable (PSP).

In addition to gaming, many console models allow users to listen to music, watch movies, and connect to the Internet.



FIGURE 1-19 Game consoles provide hours of video game entertainment.

SERVERS

A **server** controls access to the hardware, software, and other resources on a network and provides a centralized storage area for programs, data, and information (Figure 1-20). Servers support from two to several thousand connected computers at the same time.

People use personal computers or terminals to access data, information, and programs on a server. A terminal is a device with a monitor, keyboard, and memory.



FIGURE 1-20 A server controls access to resources on a network.

MAINFRAMES

A **mainframe** is a large, expensive, powerful computer that can handle hundreds or thousands of connected users simultaneously (Figure 1-21). Mainframes store huge amounts of data, instructions, and information. Most major corporations use mainframes for business activities. With mainframes, large businesses are able to bill millions of customers, prepare payroll for thousands of employees, and manage thousands of items in inventory. One study reported that mainframes process more than 83 percent of transactions around the world.

Servers and other mainframes can access data and information from a mainframe. People also can access programs on the mainframe using terminals or personal computers.



FIGURE 1-21 Mainframe computers can handle thousands of connected computers and process millions of instructions per second.

SUPERCOMPUTERS

A **supercomputer** is the fastest, most powerful computer — and the most expensive (Figure 1-22).

The fastest supercomputers are capable of processing more than 135 trillion instructions in a single second.

Applications requiring complex, sophisticated mathematical calculations use supercomputers. Large-scale simulations and applications in medicine, aerospace, automotive design, online banking, weather forecasting, nuclear energy research, and petroleum exploration use a supercomputer.

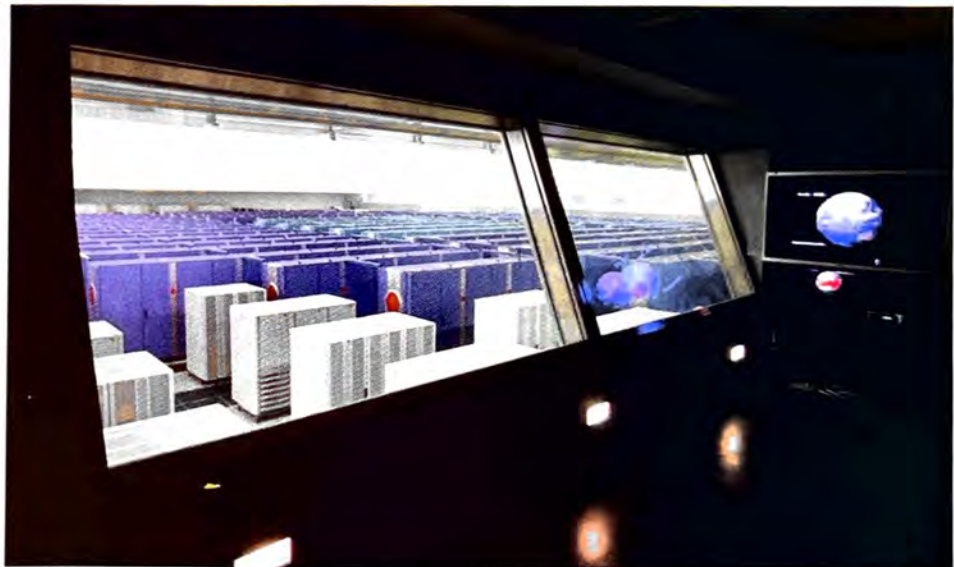


FIGURE 1-22 This supercomputer simulates various environmental occurrences such as global climate changes, pollution, and earthquakes.

EMBEDDED COMPUTERS

An **embedded computer** is a special-purpose computer that functions as a component in a larger product. A variety of everyday products contain embedded computers:

- Consumer electronics
- Home automation devices
- Automobiles
- Process controllers and robotics
- Computer devices and office machines

Because embedded computers are components in larger products, they usually are small and have limited hardware. Embedded computers perform various functions, depending on the requirements of the product in which they reside. Embedded computers in printers, for example, monitor the amount of paper in the tray, check the ink or toner level, signal if a paper jam has occurred, and so on. Figure 1-23 shows some of the many embedded computers in cars.

Adaptive cruise control systems detect if cars in front of you are too close and, if necessary, adjust the vehicle's throttle, may apply brakes, and/or sound an alarm.

Tire pressure monitoring systems send warning signals if tire pressure is insufficient.



Drive-by-wire systems sense pressure on the gas pedal and communicate electronically to the engine how much and how fast to accelerate.

Advanced airbag systems have crash-severity sensors that determine the appropriate level to inflate the airbag, reducing the chance of airbag injury in low-speed accidents.

Cars equipped with wireless communications capabilities, called **telematics**, include such features as navigation systems and Internet access.

FIGURE 1-23 Some of the embedded computers designed to improve your safety, security, and performance in today's automobiles.

EXAMPLES OF COMPUTER USAGE

Every day, people around the world rely on different types of computers for a variety of applications. To illustrate the range of uses for computers, this section takes you on a visual and narrative tour of five categories of users: a home user, a small office/home office (SOHO) user, a mobile user, a power user, and a large business user.



FAQ 1-3

Can I watch a DVD on my computer?

Yes, in most cases. Simply insert the DVD in the computer's DVD drive. Within a few seconds, you should see the DVD begin to play on your computer's screen. If the DVD does not play, it is possible you need to run a program that starts the DVD. For more information, visit scs.site.com/dcf4e/ch1/faq and then click DVDs.

Home User

In an increasing number of homes, the computer is a basic necessity. Each family member, or **home user**, spends time on the computer for different reasons. These include budgeting and personal financial management, Web access, communications, and entertainment (Figure 1-24).

On the Internet, home users access a huge amount of information, take college classes, pay bills, manage investments, shop, listen to the radio, watch movies, read books, play games, file taxes, book airline reservations, and make telephone calls. They also communicate with others around the world through e-mail, blogs, instant messaging, and chat rooms. Home users share ideas, interests, photos, music, and videos on social networking Web sites, or online social networks (read Ethics & Issues 1-2 for a related discussion).

Many home users have a portable media player, so they can listen to downloaded music and/or podcasts at a later time through earphones attached to the player. They also usually have one or more game consoles to play video games.

Today's homes typically have one or more desktop computers. Some home users network multiple desktop computers throughout the house, often wirelessly. These small networks allow family members to share an Internet connection and a printer.

Home users have a variety of software. They type letters, homework assignments, and other documents with word processing software. Personal finance software helps the home user with personal finances, investments, and family budgets. Other software assists with preparing taxes, keeping a household inventory, and setting up maintenance schedules.

Reference software, such as encyclopedias, medical dictionaries, or a road atlas, provides valuable information for everyone in the family. With entertainment software, the home user can play games, compose music, research genealogy, or create greeting cards. Educational software helps adults learn to speak a foreign language and youngsters to read, write, count, and spell.

FIGURE 1-24a (personal financial management)

FIGURE 1-24b
(Web access)

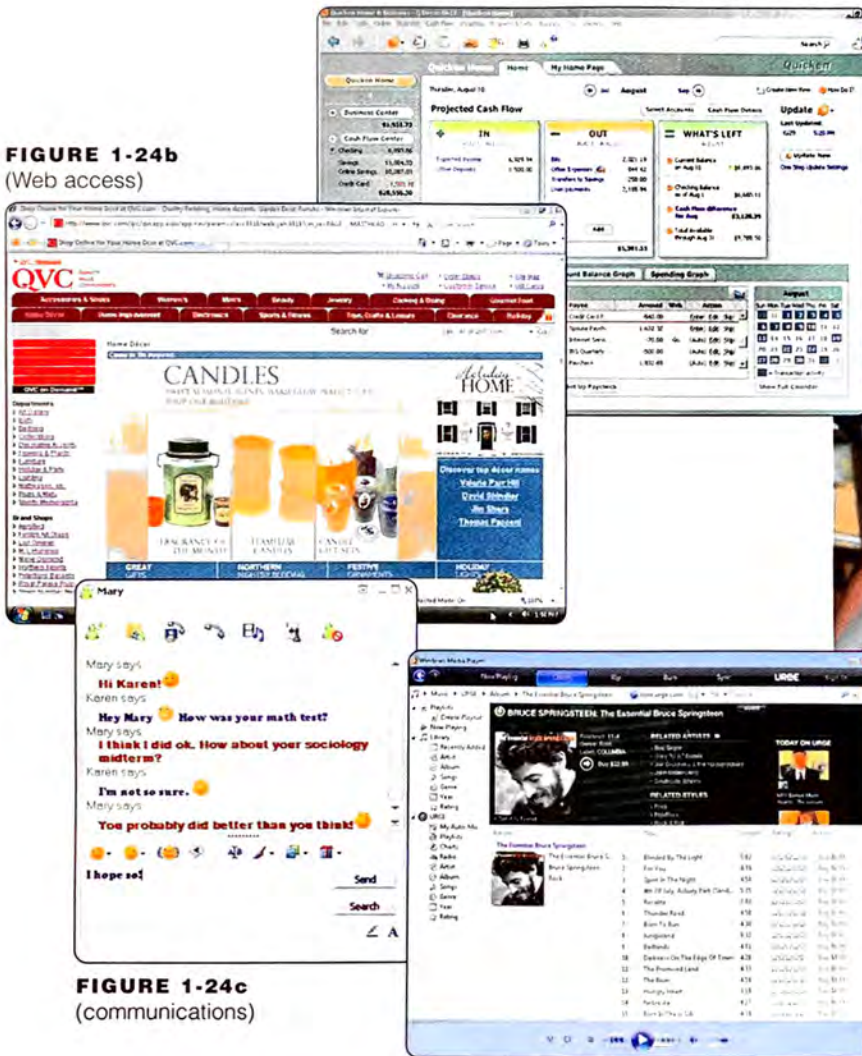


FIGURE 1-24c
(communications)

FIGURE 1-24d (entertainment)

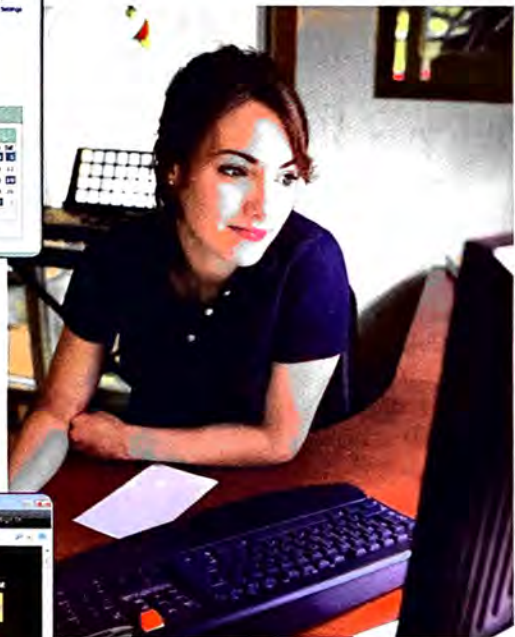


FIGURE 1-24 The home user spends time on a computer for a variety of reasons.

ETHICS & ISSUES 1-2

Who Should Monitor Online Social Networks?

In recent years, online social networks such as MySpace exploded as a new means of communicating and socializing for teens and young adults. Not surprisingly, the problems associated with these online networks mirror some problems in society in general. Problems include bullying, smear campaigns against individuals, and inappropriate contact between adults and minors. Recently, a high-school-aged girl secretly left the country with the intent of marrying an adult in the foreign country whom she met on a social networking site. Fortunately, authorities in the foreign country intercepted her at the airport and sent her home. Some parents claim that the social networking sites should better monitor and report inappropriate behavior. While the sites have stepped up monitoring, they often claim that they are just providing a forum, and parents and authorities should be responsible for the inappropriate actions of its members. Many teens and young adults feel that the problems are simply a matter of personal responsibility and using care when online. Should providers of online social networks be required to monitor and stop inappropriate or socially unacceptable behavior? Why or why not? What role should parents play in overseeing a child's involvement in online social networks? Why? Should police or other government authorities be responsible for maintaining order in online social networks in the same way they are charged with maintaining order in society in general? Why or why not?

Small Office/Home Office User

Computers assist small business and home office users in managing their resources effectively. A **small office/home office (SOHO)** includes any company with fewer than 50 employees, as well as the self-employed who work from home. Small offices include local law practices, accounting firms, travel agencies, and florists. SOHO users typically use a desktop computer. Many also use PDAs.

SOHO users access the Internet — often wirelessly — to look up information such as addresses, directions (Figure 1-25a), postal codes, flights, and package shipping rates or to make telephone calls. Nearly all SOHO users communicate through e-mail. Many are entering the e-commerce arena and

FIGURE 1-25a (Web access)

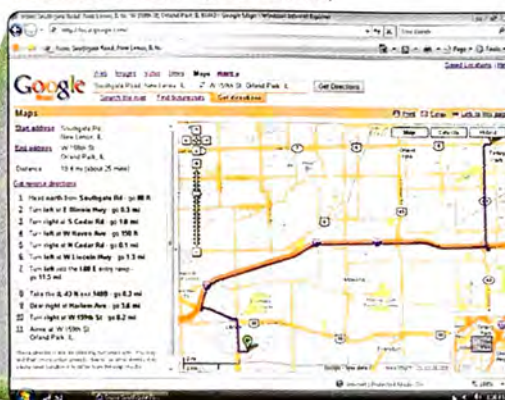


FIGURE 1-25b (spreadsheet program)

	Employee	Dependents	Hour	Wanted	Gross Pay	Federal Tax	State Tax	Net Pay	% Taxes
1	Vernice Frost	1	14.00	20.00	\$140.00	\$14.00	\$7.00	\$119.00	21.43%
2	Vernice Frost	2	11.20	43.50	\$448.00	\$89.60	\$17.92	\$340.48	21.86%
3	Anthony Sanchez	2	15.90	21.25	\$237.90	\$47.58	\$11.82	\$178.30	18.25%
4	Alma Martin	3	11.30	21.50	\$205.50	\$41.10	\$10.28	\$154.12	18.05%
5	Harold Foster	1	10.00	21.25	\$106.25	\$21.25	\$5.31	\$79.69	21.80%
6	Lyn Romberg	3	10.75	40.00	\$408.00	\$81.60	\$17.20	\$309.20	21.84%
7	Camryn Alvarez	1	12.40	21.50	\$258.40	\$51.68	\$12.96	\$194.76	22.29%
8	Fernando	4	14.50	21.50	\$247.50	\$49.50	\$12.19	\$185.81	24.04%
9	Charles Martinez	1	14.00	33.00	\$154.00	\$30.80	\$7.70	\$115.50	18.83%
10	Vernice Frost	3	8.00	29.25	\$113.00	\$22.60	\$5.65	\$84.75	20.05%
11	Total				\$1,474.40	\$294.88	\$73.94	\$1,105.58	21.35%
12	Average	2	\$12.25	20.71	\$167.50	\$33.50	\$8.38	\$125.62	21.16%
13	High	4	\$16.00	43.50	\$544.00	\$108.80	\$27.20	\$408.00	23.69%
14	Low	1	\$8.00	20.00	\$80.00	\$16.00	\$4.00	\$60.00	20.00%

conduct business on the Web. Their Web sites advertise products and services and may provide a means for taking orders.

To save money on hardware and software, small offices often network their computers. For example, the small office connects one printer to a network for all employees to share.

SOHO users often have basic business software such as word processing and spreadsheet software to assist with document preparation and finances (Figure 1-25b). They are likely to use other industry-specific types of software. A candy shop, for example, will have software that allows for taking orders and payments, updating inventory, and paying vendors.

Mobile User

Today, businesses and schools are expanding to serve people across the country and around the world. Thus, increasingly more employees and students are **mobile users**, who work on a computer while away from a main office or school (Figure 1-26). Some examples of mobile users are sales representatives, real estate agents, insurance agents, meter readers, package delivery people, journalists, and students.



FIGURE 1-25 People with a home office and employees in small offices typically use a personal computer.



FIGURE 1-26 Mobile users have notebook computers, Tablet PCs, PDAs, and smart phones so they can work, do homework, send messages, or connect to the Internet while away from a wired connection.

Mobile users often have a notebook computer, Tablet PC, Internet-enabled PDA, or smart phone. With these computers and devices, the mobile user can connect to other computers on a network or the Internet, often wirelessly accessing services such as e-mail and the Web. Mobile users can transfer information between their mobile devices and another computer.

The mobile user works with basic business software such as word processing and spreadsheet software. With presentation graphics software, the mobile user can create and deliver presentations to a large audience by connecting a mobile computer or device to a video projector that displays the presentation on a full screen.

Power User

Another category of user, called a **power user**, requires the capabilities of a powerful desktop computer, called a workstation (Figure 1-27). Examples of power users include engineers, scientists, architects, desktop publishers, and graphic artists. Power users typically work with multimedia, combining text, graphics, audio, and video into one application. These users need computers with extremely fast processors because of the nature of their work.

The power user's workstation contains industry-specific software. For example, engineers and architects use software to draft and design floor plans, mechanical assemblies, or vehicles. A desktop publisher uses software to prepare marketing literature such as newsletters, brochures, and annual reports. A geologist uses software to study the earth's surface. This software usually is expensive because of its specialized design.

Power users exist in all types of businesses. Some also work at home. Their computers typically have network connections and Internet access.



FIGURE 1-27 This graphic artist uses a powerful computer to edit video.

Large Business User

A large business has hundreds or thousands of employees or customers that work in or do business with offices across a region, the country, or the world. Each employee or customer who uses a computer in the large business is a **large business user** (Figure 1-28).

Many large companies use the words, **enterprise computing**, to refer to the huge network of computers that meets their diverse computing needs. The network facilitates communications among employees at all locations. Users access the network through desktop computers, mobile computers, PDAs, and smart phones.

Large businesses use computers and the computer network to process high volumes of transactions in a single day. Although they may differ in size and in the products or services offered, all generally use computers for basic business activities. For example, they bill millions of customers or prepare payroll for thousands of employees. Some large businesses use blogs to open communications among employees and/or customers.

Large businesses typically have e-commerce Web sites, allowing customers and vendors to conduct business online. The Web site showcases products, services, and other company information. Customers, vendors, and other interested parties can access this information on the Web.

The marketing department in a large business uses desktop publishing software to prepare marketing literature. The accounting department uses software for accounts receivable, accounts payable, billing, general ledger, and payroll activities.

Large business users work with word processing, spreadsheet, database, and presentation graphics software. They also may use calendar programs to post their schedules on the network. And, they might use PDAs or smart phones to maintain contact information. E-mail and Web browsers enable communications among employees, vendors, and customers.

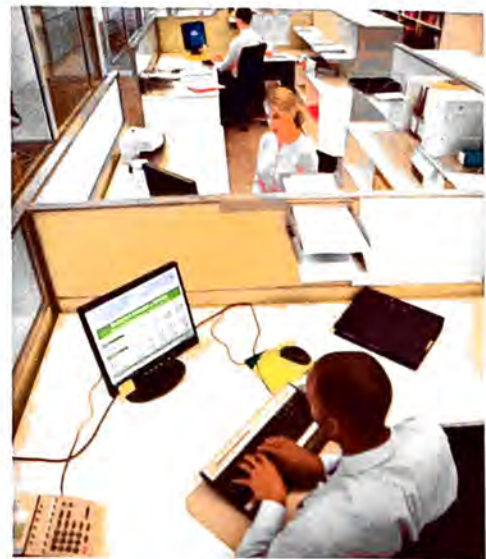


FIGURE 1-28 A large business can have hundreds or thousands of users in offices across a region, the country, or the world.

Many employees of large businesses today telecommute (Figure 1-29). **Telecommuting** is a work arrangement in which employees work away from a company's standard workplace and often communicate with the office through the computer. Employees who telecommute have flexible work schedules so they can combine work and personal responsibilities, such as child care.



FIGURE 1-29 Many employees of large businesses telecommute, which allows them to combine work and other responsibilities.

COMPUTER APPLICATIONS IN SOCIETY

The computer has changed society today as much as the industrial revolution changed society in the eighteenth and nineteenth centuries.

People interact directly with computers in fields such as education, finance, government, health care, science, publishing, travel, and manufacturing. In addition, they can reap the benefits from breakthroughs and advances in these fields. The following pages describe how computers have made a difference in people's interactions with these disciplines. Read Looking Ahead 1-2 for a look at the next generation of computer applications in society.



LOOKING AHEAD 1-2

Robots Perform Mundane, Dangerous Tasks



Playwright Karel Capek created the name, robot, for his humanoid machines that turned against their creators. Today, mobile, intelligent robots perform tasks typically reserved for humans in a \$5 billion global market.

Tomorrow's practical and versatile robots will serve a variety of personal and industrial needs. By 2010, the expected \$17 billion market should include products to care for senior citizens, transport people in major cities, and perform hundreds of thousands of mobile utility jobs, such as picking up and delivering items.

The Anna Konda is a snakelike robot built by Norway's Foundation for Industrial and Scientific Research that can maneuver over varied terrain. Engineers envision its possible uses include fighting fires, locating and bringing oxygen to earthquake victims buried under debris, and performing maintenance on underwater oil rigs. For more information, visit scs.site.com/dcf4e/ch1/looking and then click Robots.

Education

Education is the process of acquiring knowledge. In the traditional model, people learn from other people such as parents, teachers, and employers. Many forms of printed material such as books and manuals are used as learning tools. Today, educators also are turning to computers to assist with education (Figure 1-30).

Many schools and companies equip labs and classrooms with computers. Some schools require students to have a notebook computer or PDA to access the school's network or Internet wirelessly.

Students use software to assist with learning or to complete assignments. To promote education by computer, many vendors offer substantial student discounts on software.



FIGURE 1-30 In some schools, students have notebook computers on their desks during classroom lectures.

Sometimes, the delivery of education occurs at one place while the learning occurs at other locations. For example, students can take a class on the Web. More than 70 percent of colleges offer some type of distance learning classes. A few even offer entire degrees online.

Finance

Many people and companies use computers to help manage their finances. Some use finance software to balance checkbooks, pay bills, track personal income and expenses, manage investments, and evaluate financial plans. This software usually includes a variety of online services. For example, computer users can track investments and do online banking (Figure 1-31). With **online banking**, users access account balances, pay bills, and copy monthly transactions from the bank's computer right into their computers.

Investors often use **online investing** to buy and sell stocks and bonds — without using a broker. With online investing, the transaction fee for each trade usually is much less than when trading through a broker.



FIGURE 1-31 Many financial institutions' Web sites offer online banking.

Government

A government provides society with direction by making and administering policies. To provide citizens with up-to-date information, most government offices have Web sites. People access government Web sites to file taxes, apply for permits and licenses, pay parking tickets, buy stamps, report crimes, apply for financial aid, and renew vehicle registrations and driver's licenses.

Employees of government agencies use computers as part of their daily routine. Military and other agency officials use the U.S. Department of Homeland Security's network of information about domestic security threats to help protect our nation. Law enforcement officers have online access to the FBI's National Crime Information Center (NCIC) through in-vehicle computers, fingerprint scanners, and PDAs (Figure 1-32). The NCIC contains more than 52 million missing persons and criminal records, including names, fingerprints, parole/probation records, mug shots, and other information.



FIGURE 1-32 Law enforcement officials have in-vehicle computers and PDAs to access emergency, missing person, and criminal records in computer networks in local, state, and federal agencies.

Health Care

Nearly every area of health care uses computers. Whether you are visiting a family doctor for a regular checkup, having lab work or an outpatient test, or being rushed in for emergency surgery, the medical staff around you will be using computers for various purposes:

- Hospitals and doctors use computers to maintain patient records.
- Computers monitor patients' vital signs in hospital rooms and at home.
- Doctors use the Web and medical software to assist with researching and diagnosing health conditions.
- Doctors use e-mail to correspond with patients.
- Pharmacists use computers to file insurance claims.

- Computers and computerized devices assist doctors, nurses, and technicians with medical tests (Figure 1-33).
- Surgeons implant computerized devices, such as pacemakers, that allow patients to live longer.
- Surgeons use computer-controlled devices to provide them with greater precision during operations, such as for laser eye surgery and robot-assisted heart surgery.

An exciting development in health care is telemedicine, which is a form of long-distance health care. Through **telemedicine**, health-care professionals in separate locations conduct live conferences on the computer. For example, a doctor at one location can have a conference with a doctor at another location to discuss a bone X-ray. Live images of each doctor, along with the X-ray, are displayed on each doctor's computer.

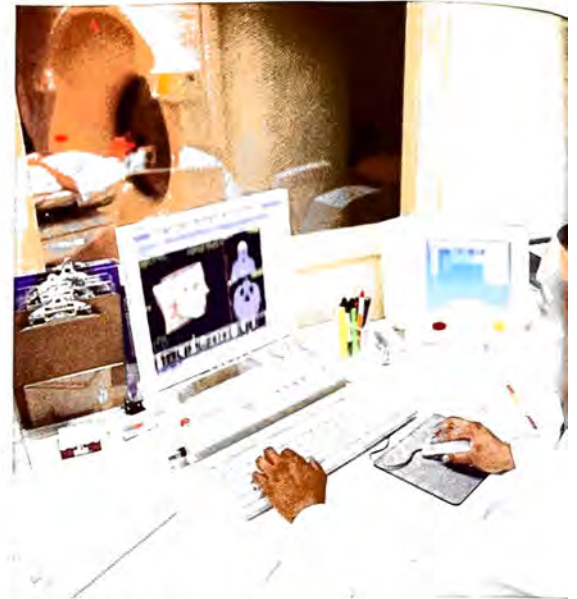


FIGURE 1-33 Doctors, nurses, technicians, and other medical staff use computers while performing tests on patients.

Science

All branches of science, from biology to astronomy to meteorology, use computers to assist them with collecting, analyzing, and modeling data. Scientists also use the Internet to communicate with colleagues around the world.

Breakthroughs in surgery, medicine, and treatments often result from scientists' use of computers. Tiny computers now imitate functions of the central nervous system, retina of the eye, and cochlea of the ear. A cochlear implant allows a deaf person to listen. Electrodes implanted in the brain stop tremors associated with Parkinson's disease. Cameras small enough to swallow — sometimes called a camera pill — take pictures inside your body to detect polyps, cancer, and other abnormalities (Figure 1-34).

FIGURE 1-34 HOW A CAMERA PILL WORKS

Step 1:

A patient swallows a tiny capsule that contains a miniature disposable camera, lights, a transmitter, and batteries. The camera is positioned at the clear end of the capsule.



Step 2:

As the capsule moves through the inside of the patient's body, the camera snaps about 50,000 pictures, which are transmitted to a recording device worn as a belt on the patient's waist.

Step 3:

The doctor transfers the data on the recording device to a computer so it can be processed and analyzed.



Publishing

Publishing is the process of making work available to the public. These works include books, magazines, newspapers, music, film, and video. Special software assists graphic designers in developing pages that include text, graphics, and photographs; artists in composing and enhancing songs; film-makers in creating and editing film; and journalists and mobile users in capturing and modifying video clips.

Many publishers make their works available online (Figure 1-35). Some Web sites allow you to copy the work, such as a book or music, to your desktop computer, handheld computer, PDA, or smart phone.

Travel

Many vehicles manufactured today include some type of onboard navigation system. Some mobile users prefer to carry specialized handheld navigation devices (Figure 1-36).

In preparing for a trip, you may need to reserve a car, hotel, or flight. Many Web sites offer these services to the public. For example, you can order airline tickets on the Web. If you plan to drive somewhere and are unsure of the road to take to your destination, you can print directions and a map from the Web.

Manufacturing

Computer-aided manufacturing (CAM) refers to the use of computers to assist with manufacturing processes such as fabrication and assembly. Often, robots carry out processes in a CAM environment. CAM is used by a variety of industries, including oil drilling, power generation, food production, and automobile manufacturing. Automobile plants, for example, have an entire line of industrial robots that assemble a car (Figure 1-37).



FIGURE 1-35 Many magazine and newspaper publishers make the content of their publications available online.



FIGURE 1-36 This handheld navigation device gives users turn-by-turn voice-prompted directions to a destination.



FIGURE 1-37 Automotive factories use industrial robots to weld car bodies.

Test your knowledge of pages 13 through 25 in Quiz Yourself 1-3.



QUIZ YOURSELF 1-3

Instructions: Find the true statement below. Then, rewrite the remaining false statements so they are true.

1. A desktop computer is a portable, personal computer designed to fit on your lap.
2. A personal computer contains a processor, memory, and one or more input, output, and storage devices.
3. Each large business user spends time on the computer for different reasons that include budgeting and personal financial management, Web access, communications, and entertainment.
4. A home user requires the capabilities of a workstation or other powerful computer.
5. Mainframes are the fastest, most powerful computers — and the most expensive.
6. With embedded computers, users access account balances, pay bills, and copy monthly transactions from the bank's computer right into their personal computers.

Quiz Yourself Online: To further check your knowledge of categories of computers, computer users, and computer applications in society, visit scsite.com/dcf4e/ch1/quiz and then click Objectives 5 – 7.

CHAPTER SUMMARY

Chapter 1 introduced you to basic computer concepts. You learned about the components of a computer. Next, the chapter discussed networks, the Internet, and computer software. The many different categories of computers, computer users, and computer applications in society also were presented.

This chapter is an overview. Many of the terms and concepts introduced will be discussed further in later chapters. For a history of hardware and software developments, read the Timeline that follows this chapter.

CAREER CORNER

Personal Computer Salesperson



When you decide to buy or upgrade a personal computer, the most important person with whom you interact probably will be a personal computer salesperson. This individual will be a valuable resource to you in providing the information and expertise you need to select a computer that meets your requirements.

Computer manufacturers and retailers that sell several types of personal computers need competent salespeople. A **personal computer salesperson** must be computer literate and have a specific knowledge of the computers he or she sells. The salesperson also must have a working knowledge of computer peripherals (printers, scanners, cameras, etc.). In addition, a successful salesperson has a friendly, outgoing personality that helps customers feel comfortable. Through open-ended questions, the salesperson can determine a customer's needs and level of experience. With this information, the salesperson can choose the best computer for the customer and explain the features of the computer in language the customer will understand. Most computer salespeople also can recommend a qualified installer for your computer or qualified service technician.

Computer salespeople typically have at least a high school diploma. Before reaching the sales floor, however, salespeople usually complete extensive company training programs. These programs often consist of self-directed, self-paced Web-training classes. Most salespeople also participate in training updates, often on a monthly basis.

Personal computer salespeople generally earn a guaranteed amount plus a commission for each sale. A computer salesperson can earn about \$45,000 a year. Top salespeople can be among a company's more highly compensated employees, earning in excess of \$90,000 including commissions. For more information, visit scsite.com/dcf4e/ch1/careers and then click Personal Computer Salesperson.

COMPANIES ON THE CUTTING EDGE

Dell

Direct Business Computer Manufacturer

As a leading manufacturer of personal computers, Dell prides itself on its direct approach to computer sales. The company hosts one of the world's largest volume e-commerce Web sites where customers can configure and price computers and electronic components, order systems, and track their orders online.

Founded by Michael Dell in 1984, the company sells more computers globally than any computer company, placing it 25th on the FORTUNE 500.

The company set the industry standard for global recycling in 2006 when it provided free recycling of any Dell product for consumers throughout the world. Dell also has partnered with the National Cristina Foundation to distribute donated equipment to disabled and economically disadvantaged children and adults. For more information, visit scs.site.com/dcf4e/ch1/companies and then click Dell.



Apple Computer

Introducing Innovative Technologies

Millions of computer users in more than 120 countries loyally use Apple Computer's hardware and software with a passion usually reserved for sports teams and musical groups.

Steven Jobs and Stephen Wozniak founded Apple in 1976 when they marketed the Apple I, a circuit board they had developed in Jobs's garage. In 1977, Apple Computer incorporated and introduced the Apple II, the first mass-marketed personal computer. Apple introduced the Macintosh product line in 1984, which featured a graphical user interface.

Under Jobs's direction as CEO, Apple introduced award-winning desktop and notebook computers, the OS X operating system, iLife, and professional applications. The iPod is the world's most popular portable media player, and the iTunes Music Store is the number one online music store. More than 70 percent of 2007-model U.S. vehicles offer iPod integration. For more information, visit scs.site.com/dcf4e/ch1/companies and then click Apple Computer.



TECHNOLOGY TRAILBLAZERS



Bill Gates

Microsoft's Founder

Bill Gates, the founder of Microsoft Corporation, suggests that college students should learn how to learn by getting the best education they can. Because he is considered by many as the most powerful person in the computing industry, it might be wise to listen to him.

Gates learned to program computers when he was 13. Early in his career, he developed the BASIC programming language for the MITS Altair, one of the first microcomputers. He founded Microsoft in 1975 with Paul Allen, and five years later, they provided the first operating system, called MS-DOS, for the IBM PC. Today, Microsoft's Windows and Office products dominate the software market.

In July 2008, Gates plans to step out of his day-to-day role in the company. He will continue as chairman and advisor while devoting more time to his philanthropic efforts. For more information, visit scs.site.com/dcf4e/ch1/people and then click Bill Gates.



Anne Mulcahy

Xerox CEO

Color printing and consulting services are the two areas where the Xerox Corporation can make a difference, according to Anne Mulcahy, the company's CEO and chairman of the board. She should know the nature of the business, having started her career with the Stamford, Connecticut-based corporation more than 30 years ago as a field sales representative.

One of Mulcahy's first decisions after landing the top job in 2001 was eliminating the corporation's tagline, "The Document Company." She believes the company's name, standing solo, speaks for itself in the printing, copying, and services worlds. Her ethical and values-based leadership decisions to revamp the company have revolved around Xerox's roots of innovation and customer care. She is a member of the boards of directors of Target Corporation, Citigroup, and Catalyst, a not-for-profit organization supporting women in business. For more information, visit scs.site.com/dcf4e/ch1/people and then click Anne Mulcahy.