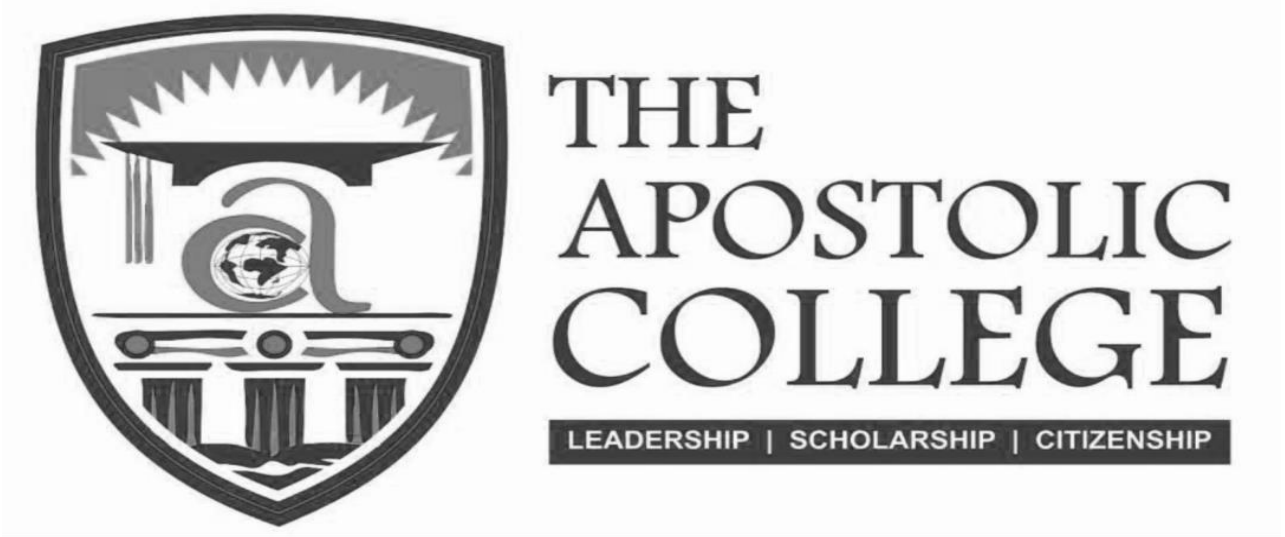

COURSE:

COMPUTER LITERACY

MODULE 1

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Contents

Chapter 1: Introduction to Computer Literacy

Computers are everywhere: at work, at school, at church, and at home. People use all types and sizes of computers for a variety of reasons and in a range of places. While some computers sit on top of a desk or on the floor, mobile computers and mobile devices are small enough to carry. Mobile devices, such as many cell phones, often are classified as computers.

Computers are a primary means of local and global communication for billions of people. Consumers use computers to correspond with businesses, employees with other employees and customers, and students with classmates and teachers. In addition to sending simple notes, people use computers to share photos, drawings, documents, calendars, journals, music, and videos.

Through computers, society has instant access to information from around the globe. Local and international news, weather reports, sports scores, airline schedules, telephone directories, maps and directions, job listings, and countless forms of educational material always are accessible. From the computer, you can make a telephone call, meet new friends, share opinions or life stories, book flights, shop, take a course, receive alerts, and automate your home.

At home or while on the road, people use computers to manage schedules and contacts, listen to voice mail messages, balance check books, pay bills, transfer funds, and buy or sell stocks. Banks place ATMs (automated teller machines) all over the world, so that customers can deposit and withdraw funds anywhere at anytime. At the church, computers are used to project sermons, presentations and videos. Others use computers while preaching to make references in the bible and some also use computers to record the Pastor's sermon.

In the workplace, employees use computers to create correspondence such as e-mail messages, memos, and letters; manage calendars; calculate payroll; and generate invoices. At school, teachers use computers to assist with classroom instruction. Students complete assignments and conduct research on computers in laboratory rooms, at home, or elsewhere. Instead of attending class on campus, some students take entire classes directly from their computer.

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 photos, and plan vacations.

As technology continues to advance, computers have become a part of everyday life. Thus, many people believe that computer literacy is vital to success in today's world. **Computer literacy**, also known as *digital literacy*, involves having a current knowledge and understanding of computers and their uses. Because the requirements that determine computer literacy change as technology changes, you must keep up with these changes to remain computer literate.

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.

Many daily activities either involve the use of or depend on information from a computer. For example, computers process several data items to print information in the form of a cash register receipt.

Information Processing Cycle

Computers process data (input) into information (output). Computers carry out processes using *instructions*, which are the steps that tell the computer how to perform a particular task. A collection of related instructions organized for a common purpose is referred to as software. A computer often holds data, information, and instructions in storage for future use. Some people refer to the series of input, process, output, and storage activities as the *information processing cycle*.

Most computers today communicate with other computers. As a result, communications also has become an essential element of the information processing cycle.

Chapter 2: 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 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. Five widely used input devices are the keyboard, mouse, microphone, scanner, and Web cam (Figure 1).

A computer keyboard contains keys you press to enter data into the computer. For security purposes, some keyboards include a fingerprint reader, which allows you to work with the computer only if your fingerprint is recognized.

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

A Web cam is a digital video camera that allows you to create movies or take pictures and store them on the computer instead of on tape or film.

Output Devices

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

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).

System Unit

The **system unit** is a case that contains the electronic components of the computer that are used to process data (Figure 1). 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 a *CPU* (*central processing unit*), 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. Although some forms of memory are permanent, most memory keeps data and instructions temporarily, which means its contents are erased when the computer is shut off.

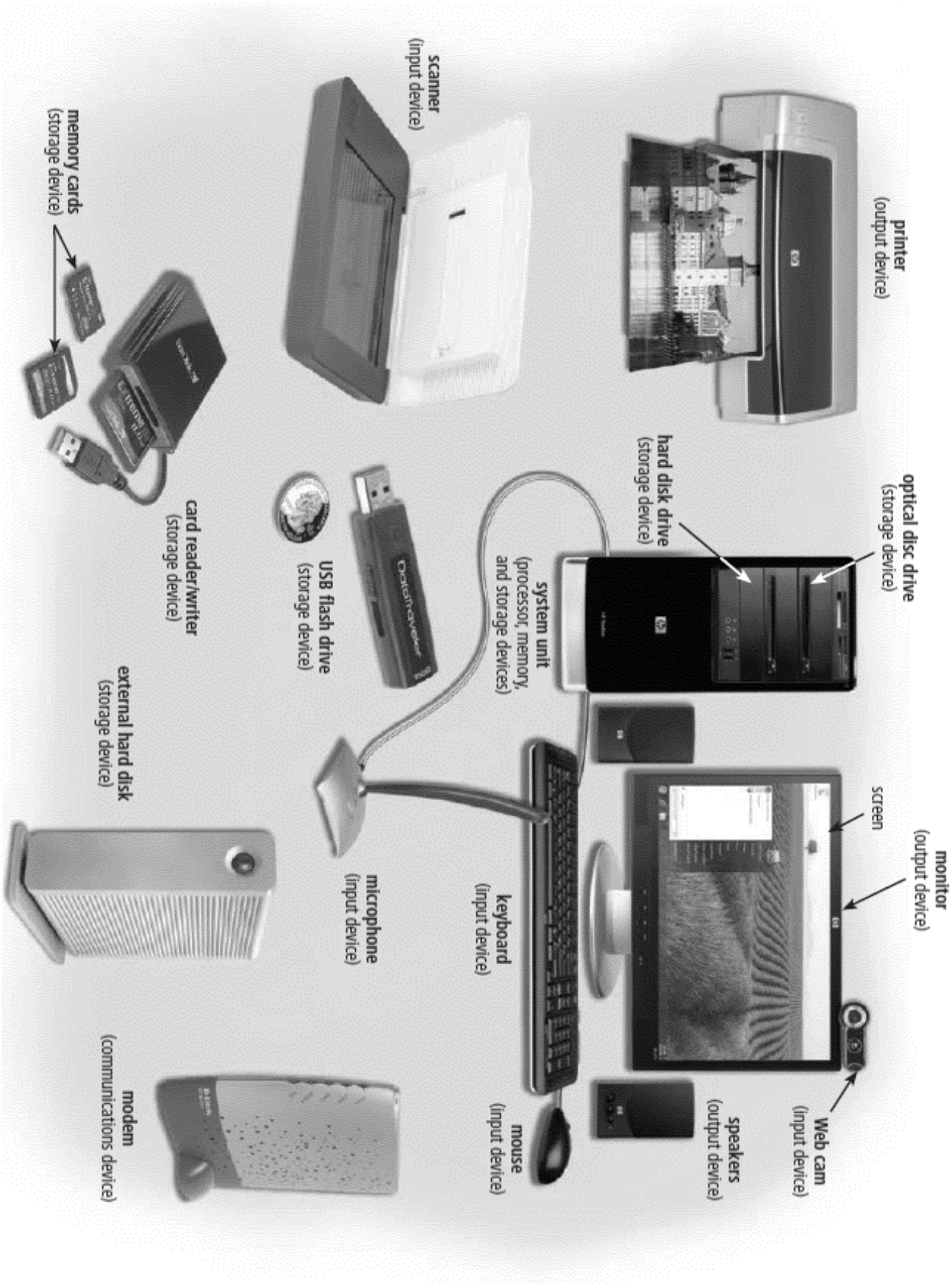

Figure 1: Common computer hardware components include a keyboard, mouse, microphone, scanner, Web cam, printer, monitor, speakers, system unit, hard disk drive, external hard disk, optical disc drive(s), USB flash drive, card reader/writer, memory cards, and modem.

Storage Devices

Storage holds data, instructions, and information for future use. For example, computers can store hundreds or millions of people 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, optical discs, and memory cards. A **storage device** records (writes) and/or retrieves (reads) items to and from storage media.

Drives and readers/writers, which are types of storage devices (Figure 1), accept a specific kind of storage media. For example, a DVD drive (storage device) accepts a DVD (storage media). Storage devices often function as a source of input because they transfer items from storage to memory.

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

Figure 2: Hard Disk

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 or mobile devices. A widely used communications device is a modem (Figure 1).

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.

Chapter 3: Advantages and Disadvantages of Using Computers

Society has reaped many benefits from using computers. A **user** is anyone who communicates with a computer or utilizes the information it generates. Users can make well-informed decisions because they have instant access to information from anywhere in the world. Students, another type of user, have more tools to assist them in the learning process.

Advantages of Using Computers

Benefits from using computers are possible because computers have the advantages of speed, reliability, consistency, storage, and communications.

1. **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. Processing involves computing (e.g., adding, subtracting), sorting (e.g., alphabetizing), organizing, displaying images, recording audio, playing music, and showing a movie or video.
2. **Reliability:** The electronic components in modern computers are dependable and reliable because they rarely break or fail.
3. **Consistency:** Given the same input and processes, a computer will produce the same results consistently. A computing phrase — known as *garbage in, garbage out* — points out that the accuracy of a computer's output depends on the accuracy of the input. For example, if you do not use the flash on a digital camera when indoors, the resulting pictures that are displayed on the computer screen may be unusable because they are too dark.
4. **Storage:** A computer can transfer data quickly from storage to memory, process it, and then store it again for future use. Many computers store enormous amounts of data and make this data available for processing anytime it is needed.
5. **Communications:** Most computers today can communicate with other computers, often wirelessly. Computers with this capability can share any of the four information processing cycle operations — input, process, output, and storage — with another computer or a user.

Disadvantages of Using Computers

Some disadvantages of computers relate to health risks, the violation of privacy, public safety, the impact on the labour force, and the impact on the environment.

1. **Health Risks:** Prolonged or improper computer use can lead to injuries or disorders of the hands, wrists, elbows, eyes, neck, and back. Computer users can protect themselves from these health risks through proper workplace design, good posture while at the computer, and appropriately spaced work breaks.
2. **Violation of Privacy:** Nearly every life event is stored in a computer somewhere . . . in medical records, credit reports, tax records, etc. In many instances, where personal and confidential records were not protected properly, individuals have found their privacy violated and identities stolen.
3. **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. Protect yourself and your dependents from these criminals by being cautious in e-mail messages and on Web sites. For example, do not share information that would allow others to identify or locate you and do not disclose identification numbers, passwords, or other personal security details.
4. **Impact on Labour Force:** Although computers have improved productivity in many ways 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.

5. **Impact on Environment:** Computer manufacturing processes and computer waste are depleting natural resources and polluting the environment. When computers are discarded in landfills, they can release toxic materials and potentially dangerous levels of lead, mercury, and flame retardants.

Green computing

Green Computing involves reducing the electricity consumed and environmental waste generated when using a computer. Strategies that support green computing include recycling, regulating manufacturing processes, extending the life of computers, and immediately donating or properly disposing of replaced computers. When you purchase a new computer, some retailers offer to dispose of your old computer properly.

Chapter 4: Networks and the Internet

Network

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. In many networks, one or more computers act as a server. The *server* controls access to the resources on a network. The other computers on the network, each called a *client* or workstation, request resources from the server (Figure 3). The major differences between the server and client computers are that the server ordinarily has more power, more storage space, and expanded communications capabilities.

Figure 3: Networked Computers and printer

The Internet

The **Internet** is a worldwide collection of networks that connects millions of businesses, government agencies, educational institutions, and individuals (Figure 4).

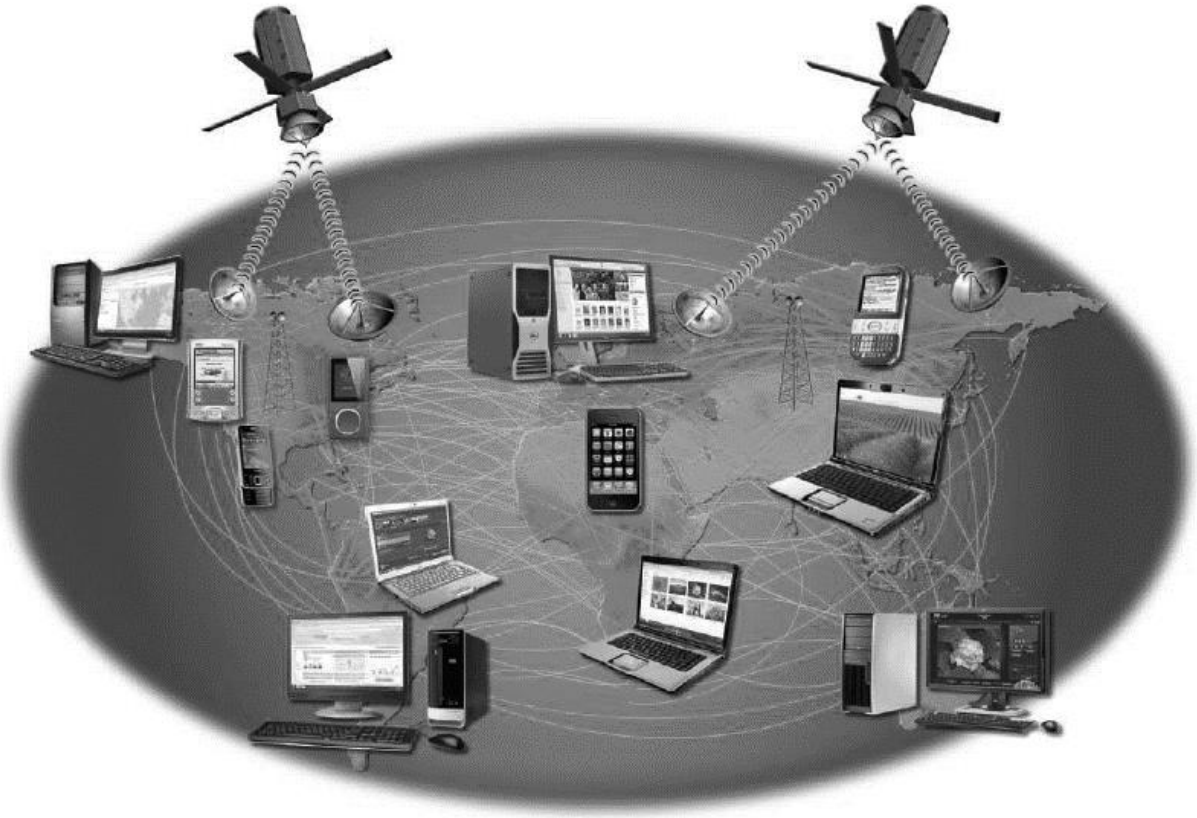

Figure 4: The Internet

More than one billion people around the world use the Internet daily for a variety of reasons, some of which are listed below:

1. Communicate with and meet other people
2. Conduct research and access a wealth of information and news
3. Shop for goods and services
4. Bank and invest
5. Participate in online training
6. Engage in entertaining activities, such as planning vacations, playing online games, listening to music, watching or editing videos, and reading books and magazines
7. Download music and videos
8. Share information, photos, and videos
9. Access and interact with Web applications

People connect to the Internet to share information with others around the world. E-mail allows you to send and receive messages to and from other users. With instant messaging, you can have a live conversation with another connected user, example Whatsapp, Facebook, WeChat etc. In a chat room, you can communicate with multiple users at the same time — much like a group discussion. You also can use the Internet to make a telephone call.

The World Wide Web (www)

The Web, short for World Wide Web, is one of the more popular services on the Internet. Think of the Web as a global library of information available to anyone connected to the Internet. The **Web** contains billions of documents called Web pages. A **Web page** can contain text, graphics, animation, audio, and video. Web pages often have built-in connections, or links, to other documents, graphics, other Web pages, or Web sites. A **Web site** is a collection of related Web pages. Some Web sites allow users to access music and videos that can be downloaded, or transferred to storage media in a computer or portable media player. Once downloaded, you can listen to the music through speakers, headphones, or earbuds, or view the videos on a display device.

Many people use the Web as a means to share personal information, photos, and videos with the world. For example, you can create a Web page and then make it available, or *publish* it, on the Internet for others to see.

You also can join millions of people worldwide in an online community, called a **social networking Web site** or an *online social network*, that encourages members to share their interests, ideas, stories, photos, music, and videos with other registered users. Some social networking Web sites are college oriented, some business oriented, and others are more focused. A **photo sharing community,** for example, is a specific type of social networking Web site that allows users to create an online photo album and store and share their digital photos. Similarly, a **video sharing community** is a type of social networking Web site that allows users to store and share their personal videos.

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 timestamped articles in a diary or journal format, usually listed in reverse chronological order. As others read the articles in a blog, they reply with their own thoughts. A blog that contains video clips is called a *video blog*. A *microblog*, such as Twitter, allows users to publish short messages, usually between 100 and 200 characters, for others to read.

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. A video podcast is a podcast that contains video and usually audio. At a convenient time and location, the user listens to or watches the downloaded podcast.

A **Web application** is a Web site that allows users to access and interact with software from any computer or device that is connected to the Internet. Examples of software available as Web applications include those that allow you to send and receive e-mail messages, organize digital photos, create documents, and play games.

Chapter 5: Computer Software

Software, also called a **program**, consists of a series of related instructions, organized for a common purpose, that tells the computer what tasks to perform and how to perform them.

You interact with a program through its user interface. The user interface controls how you enter data and instructions and how information is displayed on the screen. Software today often has a graphical user interface. With a **graphical user interface** (**GUI** pronounced gooey), you interact with the software using text, graphics, and visual images such as icons.

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 softwar**e and **application software**. Figure 5 shows an example of each of these categories of software, which are explained in the following sections.

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.

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 Microsoft's Windows, or Mac OS, Apple's operating system.

When a user starts a computer, portions of the operating system are copied into memory from the computer's hard disk. These parts of the operating system remain 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. For example, you can use a utility program to transfer digital photos to an optical disc. Most operating systems include several utility programs for managing disk drives, printers, and other devices and media. You also can install utility programs that allow you to perform additional computer management functions.

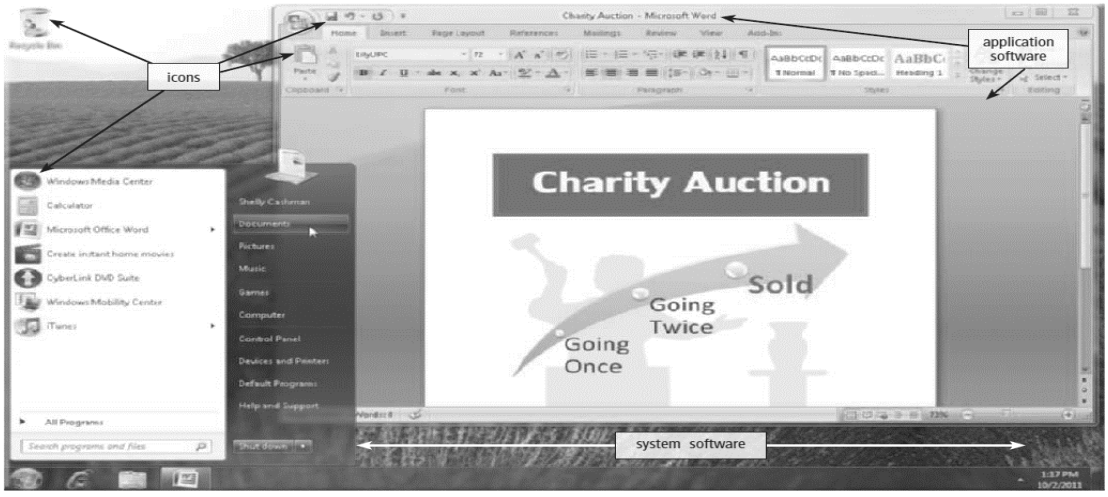

Figure 5: System and Application Software

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 or access programs. Other popular application software includes word processing software, spreadsheet software, database software, and presentation 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, photo editing, audio and video editing, multimedia authoring, Web page authoring, personal finance, legal, tax preparation, home design/landscaping, travel and mapping, education, reference, and entertainment (e.g., games or simulations, etc.).

Chapter 6: Categories of Computers

Industry experts typically classify computers in seven categories: personal computers (desktop), 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. This trend of computers and devices with technologies that overlap, called *convergence*, leads to computer manufacturers continually releasing newer models that include similar functionality and features. For example, newer cell phones often include media player, camera, and Web browsing capabilities. As devices converge, users need fewer devices for the functionality that they require.

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. Personal computers also often contain a communications device.

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

Desktop Computers

A **desktop computer** is designed so that the system unit, input devices, output devices, and any other devices fit entirely on or under a desk or table (Figures 6). In many models, the system unit is a tall and narrow *tower*, which can sit on the floor vertically — if desktop space is limited.

PC and PC-compatible computers usually use a Windows operating system.

Apple computers, such as the iMac, usually use a Macintosh operating system.

Figure 6: Personal Computers

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 and the Tablet PC.

Notebook Computers

A **notebook computer**, also called a **laptop computer**, is a portable, personal computer often designed to fit on your lap. Notebook computers are thin and lightweight, yet they can be as powerful as the average desktop computer. Some notebook computers have touch screens, allowing you to interact with the device by touching the screen, usually with the tip of a finger.

On a typical notebook computer, the keyboard is on top of the system unit, and the monitor attaches

to the system unit with hinges (Figure 8). Most notebook computers can operate on batteries or a power supply or both.

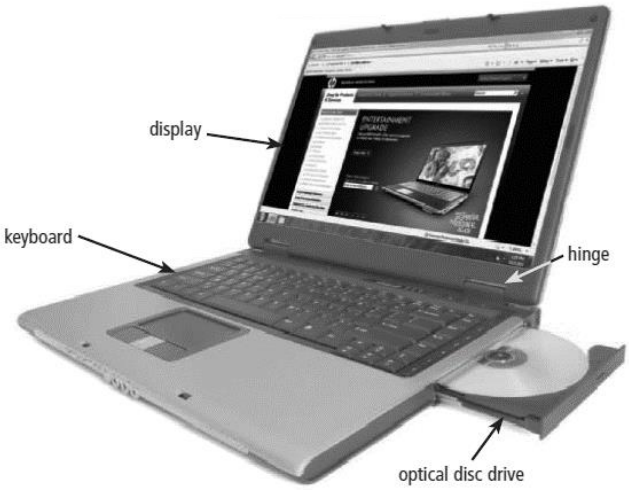

Figure 8: Notebook Computer/Laptop

Figure 7: Tablet PC

Tablet PCs 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 7). With a *digital pen*, users write or draw by pressing the pen on the screen, and issue instructions to the Tablet PC by tapping on the screen. For users who prefer typing instead of handwriting, some Tablet PC designs have an attached keyboard; others allow you to connect a separate keyboard to the device. Most Tablet PCs have touch screens. Tablet PCs also support voice input so that users can enter text and issue instructions by speaking into the computer.

Tablet PCs are useful especially for taking notes in lectures, at meetings, conferences, and other forums where the standard notebook computer is not practical.

Mobile Devices

Mobile devices, which are small enough to carry in a pocket, usually do not have disk drives. Instead, these devices store programs and data permanently on special 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 between the computer and the mobile device.

Some mobile devices are **Internet-enabled**, meaning they can connect to the Internet wirelessly. With an Internet-enabled device, users can chat, send e-mail and instant messages, and access the Web. Because of their reduced size, the screens on mobile devices are small, but usually are in colour.

Three popular types of mobile devices are smart phones, PDAs, and digital cameras.

Smart Phones: Offering the convenience of one-handed operation, a **smart phone** (Figure 10) is an Internet-enabled phone that usually also provides personal information management functions such as a calendar, an appointment book, an address book, a calculator, and a notepad. In addition to basic phone capabilities, a smart phone allows you to send and receive e-mail messages and access the Web — usually for an additional fee. Some smart phones communicate wirelessly with other devices or computers.

Many also function as a portable media player and include built-in digital cameras so that you can share photos or videos with others as soon as you capture the image. Many smart phones also offer a variety of application software such as word processing, spreadsheet, and games, and the capability of conducting live video conferences.

PDAs: A **PDA** (*personal digital assistant*) provides personal information management functions such as a calendar, an appointment book, an address book, a calculator, and a notepad (Figure 9). Most PDAs also offer a variety of other application software such as word processing, spreadsheet, personal finance, and games.

Figure 10: A Smart Phone

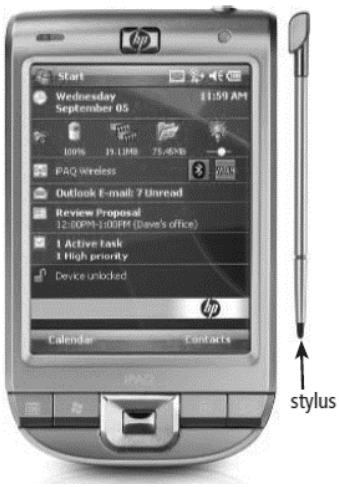

Figure 9: PDA

Digital Cameras A **digital camera** is a device that allows users to take pictures and store the photographed images digitally, instead of on traditional film (Figure 11). While many digital cameras look like a traditional camera, some are built into smart phones and other mobile devices.

Figure 11: Digital Camera

Game Consoles

A **game console** is a mobile computing device designed for single-player or multiplayer video games (Figure 12). Standard game consoles use a handheld controller(s) as an input device(s); a television screen as an output device; and hard disks, optical discs, and/or memory cards for storage. The compact size of game consoles makes 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 (pronounced wee), and Sony's PlayStation 3.

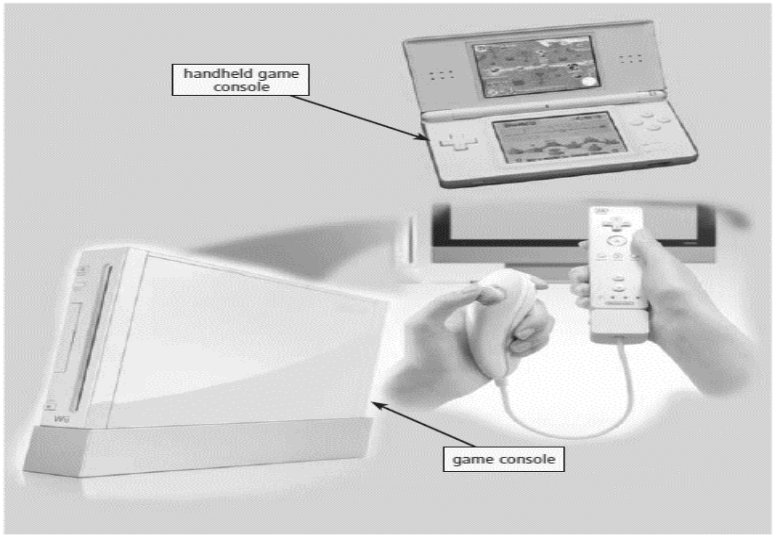

Figure 12: Game Console

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 14). Servers can support from two to several thousand connected computers at the same time.

In many cases, one server accesses data, information, and programs on another server. In other cases, 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.

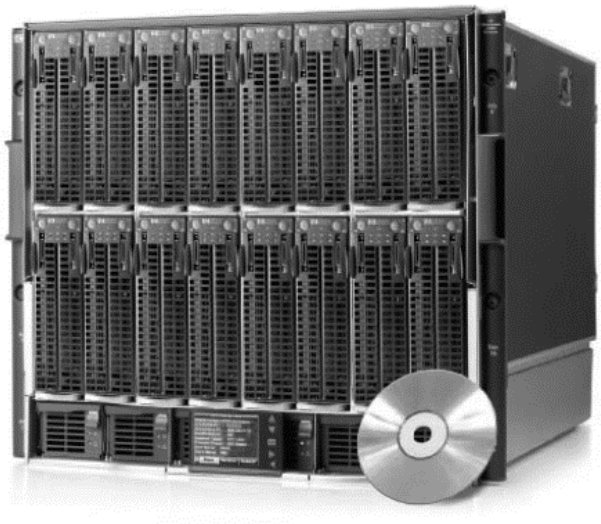

Figure 14: Servers

Figure 13: Mainframe

Mainframes

A **mainframe** is a large, expensive, powerful computer that can handle hundreds or thousands of connected users simultaneously (Figure 13). Mainframes store tremendous amounts of data, instructions, and information. Most major corporations use mainframes for business activities. With mainframes, enterprises are able to bill millions of customers, prepare payroll for thousands of employees, and manage thousands of items in inventory.

Mainframes also can act as servers in a network environment. 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.

Supercomputers

A **supercomputer** is the fastest, most powerful computer — and the most expensive (Figure 15). The fastest supercomputers are capable of processing more than one quadrillion instructions in a single second. These computers can store more than 20,000 times the data and information of an average desktop computer.

Figure 15: Supercomputer

Embedded Computers

An **embedded computer** is a special-purpose computer that functions as a component in a larger product. Embedded computers are everywhere — at home, in your car, and at work. The following list identifies a variety of everyday products that contain embedded computers.

1. Electronics: mobile and digital telephones, digital televisions, cameras, video recorders, DVD players and recorders, answering machines
2. Home Automation Devices: thermostats, sprinkling systems, security monitoring systems, appliances, lights
3. Automobiles: antilock brakes, engine control modules, airbag controller, cruise control
4. Process Controllers and Robotics: remote monitoring systems, power monitors, machine controllers, medical devices
5. Computer Devices and Office Machines: keyboards, printers, fax and copy machines

Chapter 7: Elements of an Information System

To be valuable, information must be accurate, organized, timely, accessible, useful, and cost effective to produce. Generating information from a computer requires the following five elements:

1. Hardware
2. Software
3. Data
4. People
5. Procedures

Together, these elements (hardware, software, data, people, and procedures) comprise an information system. The hardware must be reliable and capable of handling the expected workload. The software must be developed carefully and tested thoroughly. The data entered into the computer must be accurate.

Most companies with mid-sized and large computers have an IT (information technology) department. Staff in the IT department should be skilled and up-to-date on the latest technology. IT staff also should train users so that they understand how to use the computer properly. Today's users also work closely with IT staff in the development of computer applications that relate to their areas of work.

Finally, all the IT applications should have readily available documented procedures that address operating the computer and using its programs.