LEARNING OUTCOMES

By the end of this topics, you will be able to:

1. Define about computing
2. State use and misuse of computer

INTRODUCTION

Computers today are used in virtually every aspect of most individuals' lives—at home, at school, at work, and while on the go. The next few sections provide an overview of the importance of computers and some of the most common computer-related activities that individuals may encounter every day.

1.1 What is Computing

A computer can be defined as a programmable, electronic device that accepts data, per- forms operations on that data, presents the results, and stores the data or results as needed. The fact that a computer is programmable means that a computer will do whatever the instructions—called the program—tell it to do. The programs used with a computer deter- mine the tasks the computer is able to perform.

The four operations described in this definition are more technically referred to as input, processing, output, and storage. These four primary operations of a computer can be defined as follows:

➤ Input—entering data into the computer.

➤ Processing—performing operations on the data.

Output—presenting the results.

➤ Storage—saving data, programs, or output for future use.

For example, assume that you have a computer that has been programmed to add two numbers. As shown in Figure 1, input occurs when data (in this example, the numbers 2 and 5) is entered into the computer, processing takes place when the computer program adds those two numbers, and output happens when the sum of 7 is displayed on the com- puter screen. The storage operation occurs any time the data, a change to a program, or the output is saved for future use.

For an additional example, look at a supermarket barcode reader to see how it fits this definition of a computer. First, the grocery item being purchased is passed over the bar- code reader—input. Next, the description and price of the item are looked up—processing. Then, the item description and price are displayed on the cash register and printed on the receipt—output. Finally, the inventory, ordering, and sales records are updated—storage.

This progression of input, processing, output, and storage is sometimes referred to as the IPOS cycle or the information processing cycle. In addition to these four primary com- puter operations, today's computers almost always perform communications functions, such as sending or retrieving data via the Internet, accessing information located in a shared com- pany database, or exchanging data or e-mail messages with others. Therefore, communica- tions— technically an input or output operation, depending on which direction the information is going—is often considered the fifth primary computer operation.
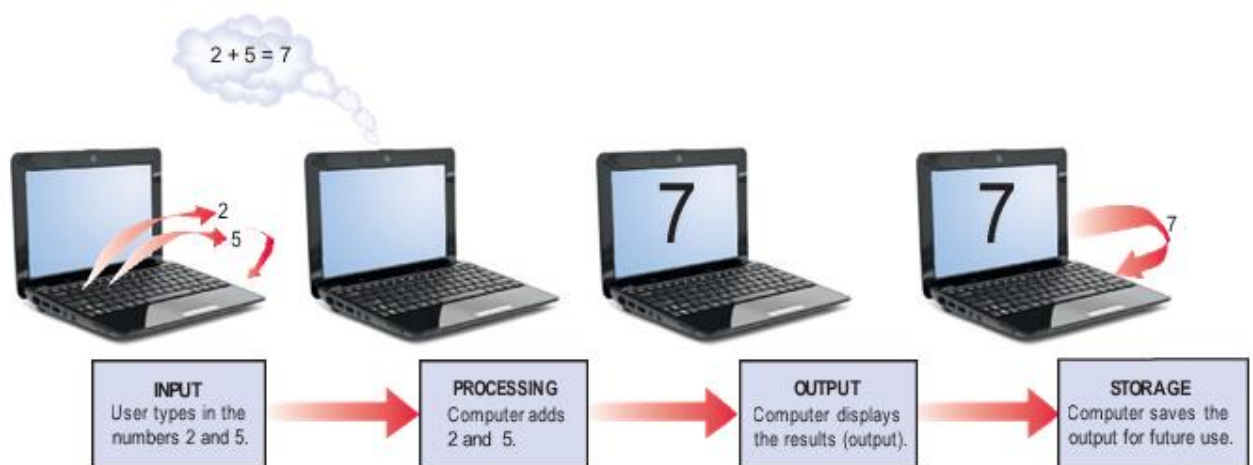

Figure 1

1.1.1 Data vs Information

As just discussed, a user inputs data into a computer, and then the computer processes it. Almost any kind of fact or set of facts can become computer data, such as the words in a letter to a friend, the numbers in a monthly budget, the images in a photograph, the notes in a song, or the facts stored in an employee record. When data is processed into a meaningful form, it becomes information.

Information is frequently generated to answer some type of question, such as how many of a restaurant's employees work less than 20 hours per week, how many seats are available on a particular flight from Los Angeles to San Francisco, or what is Hank Aaron's lifetime home run total. Of course, you don't need a computer system to process data into information; for example, anyone can go through time cards or employee files and make a list of people who work a certain number of hours. If this work is done by hand, however, it could take a lot of time, especially for a company with a large number of employees. Computers, how- ever, can perform such tasks almost instantly, with accurate results. Information processing (the conversion of data into information) is a vital activity today for all computer users, as well as for businesses and other organizations.

1.2 Why I chose this field

Fifty years ago, Information Technology and Communication (ICT) were used primarily by researchers and scientists. Today, technology are an integral part of our lives. Experts call this trend pervasive computing, in which few aspects of daily life remain untouched by computers and computing technology. With pervasive computing- also referred to as ubiquitous computing- computers are found virtually everywhere and computing technology is integrated into an ever-increasing number of devices to give those devices additional functionality, such as enabling them to communicate with other devices on an ongoing basis. Because of the prominence of computers in our society, it is important to understand what a computer is, a little about how a computer works, and the implications of living in a computer-oriented society.

1.3 The use and misuse of computers in organisations

Furthermore, the use of computers generally required a lot of technical knowledge and the use of the Internet was reserved primarily for researchers and educational institutions. Because there were few good reasons or opportunities for learning how to use computers, the average person was unfamiliar with them.

Today's computers are very useful tools for these purposes; they are also taking on new roles in our society, such as delivering entertainment on demand. In fact, computers and the traditional communications and entertainment devices that we use every day—such as telephones, televisions, gaming devices, and home entertainment systems—are converging into single units with multiple capabilities. For instance, you can check your e-mail (electronic messages), watch videos, and view other Internet content on your living room TV; you can make telephone calls via your personal computer; and you can view Internet content and watch TV on your smartphone or other mobile device (see Figure 1.1). As a result of this convergence trend, the computer is no longer an isolated productivity tool; instead, it is an integral part of our daily lives.

TELEVISIONS
Can be used to access Web pages, e-mail, streaming movies, and other Internet content, in addition to viewing TV content.

SMARTPHONES
Can be used to access Internet content, play music and games, take photos, watch TV shows, and more, in addition to making phone calls.

Used with permission from Microsoft Corporation

Figure 1.1

1.3.1 Computers in the home

Home computing has increased dramatically over the last few years as computers and Internet access have become less expensive and as a vast array of online consumer activities have become available. Use of the Internet at home to look up information, exchange e-mail, shop, watch TV and videos, download music and movies, research products, pay bills and manage bank accounts, check news and weather, store and organize digital photos, play games, make vacation plans, and so forth is now the norm for many individuals (see Figure 1-2). Many individuals also use a computer at home for work-related tasks, such as to review work-related documents or check work e-mail from home.

As the Internet, wireless technology, and devices such as computers, tele- visions, mobile phones, digital video recorders (DVRs), and gaming consoles continue to converge, the computer is also becoming a central part of home entertainment. Wireless networking allows the use of computers in virtually any location and both online and offline content to be sent wirelessly from one device to another. Both voice and video telephone calls can be made over your Internet connection, and your TV can display Internet content.

Computing technologies also make it possible to have smart appliances— traditional appliances (such as refrigerators, thermostats, or ovens) with some type of built-in computer or communications technology that allows them to be con- trolled by the user via a smartphone or the Internet, to access and display Internet information, or to perform other computer-related functions. Smart homes— homes in which household tasks (such as watering the lawn, turning the air conditioning on or off, making coffee, monitoring the security of the home and grounds, and managing home entertainment content) are controlled by a main computer in the home or by the homeowner remotely via a smartphone—have arrived, and they are expected to be the norm in less than a decade. Some believe that one primary focus of smart appliances and smart

homes will be energy conservation—for instance, the ability to perform tasks (such as running the dishwasher and watering the lawn) during nonpeak energy periods and to potentially transfer waste heat from one appliance (such as an oven) to another appliance (such as a dishwasher) as needed.

REFERENCE
Retrieving information, obtaining news, viewing recipes, shopping online, and exchanging e-mail are popular home computer activities.

PRODUCTIVITY
Home computers are frequently used for editing and managing digital photos and home videos, creating and editing work-related documents, paying bills, and other productivity tasks.

Figure 1.2

Computers in Education

Today's youth can definitely be called the computing generation. From handheld gaming devices to mobile phones to computers at school and home, most children and teens today have been exposed to computers and related technology all their lives. Although the amount of computer use varies from school to school and from grade level to grade level, most students today have access to computers at school—and some schools have completely integrated computers into the curriculum, such as by adopting e-book (electronic) textbooks that run on school-owned portable computers, or allowing students to bring in devices to use in class (referred to as BYOD or Bring Your Own Device). Many schools (particularly college campuses) today also have wireless hotspots that allow students to connect their personal computers or mobile devices wirelessly to the Internet from anywhere on campus.

Misuse of the computers in organisations

Computers can be misused at the workplace in a variety of different ways. From accessing inappropriate Internet sites to copying copyrighted material, such as music, video or software, employees can make offenses against the employer corporate policies. In addition, non-work related Internet activity, such as visiting sport sites, bidding online, trading stocks, shopping online, and collecting and sending jokes to co-workers may also infringe Information Security or Information Technology (IT) resources policies.

It is known that one of the most common ways of computer misuse in the workplace is the utilization of corporate e-mail and the Internet for private use. Most companies use Internet as a powerful business tool, but sometimes the misuse of that asset could turn out to be very expensive as it consumes IT resources and affects negatively employee productivity, in addition to compromise security. Some businesses accept the personal use of IT resources at the workplace, but there is a faulty line that divides what is right and wrong in terms of personal use.

Other more serious offenses may include access to unauthorized or confidential material, cyberstalking, identify and information theft, hacking, embezzlement, child pornography etc. Internal computers can also be used to commit fraud against the employer or its customers or suppliers. In some cases involving an employee accessing certain types of illegal websites, a company may be subject to criminal investigation. Computer related evidence can also be used to investigate cases of bribes.

Failures to protect the internal network can put companies in situations where information systems can be compromised, private or confidential information leaked, or even computers being used by criminal networks via botnets. In cases like this, companies may find its computer systems confiscated for inspection as part of criminal investigation, in addition to being subject to damages in reputation.

1.3.1 Green Computing

The term green computing refers to the use of computers in an environmentally friendly manner. Minimizing the use of natural resources, such as energy and paper, is one aspect of green computing. In 1992, the U.S. Environmental Protection Agency (EPA) introduced ENERGY STAR as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. Computers and monitors were among the first labeled products; an ENERGY STAR- qualified computer will use between 30% and 65% less energy, depending on how it is used. Today, the ENERGY STAR label (see Figure 1.3) appears on office equip- ment, residential heating and cooling equipment, major appliances, lighting, home electronics, and more. Eco-labels—environmental performance certifications—are also used in other countries.

In addition to being more energy-efficient, computers today are being built to run quieter and cooler, and they are using more recyclable hardware and packaging. Many computer

manufacturers are also reducing the amount of toxic chemicals being used in personal computers. For instance, Dell bans the use of some hazardous chemicals, such as cadmium and mercury; has reduced the amount of lead used in several desktop computers; and meets the European Union requirement of being completely lead-free for all electronics shipped to the EU. Some mobile phones are also going green, being made out of recycled plastics, including solar panels to charge the phone's battery, and including a pedometer and other apps to calculate the volume of CO_2 emissions you have avoided by not driving.

Figure 1.3