Chapter One

Introduction to Computers and Information Technology

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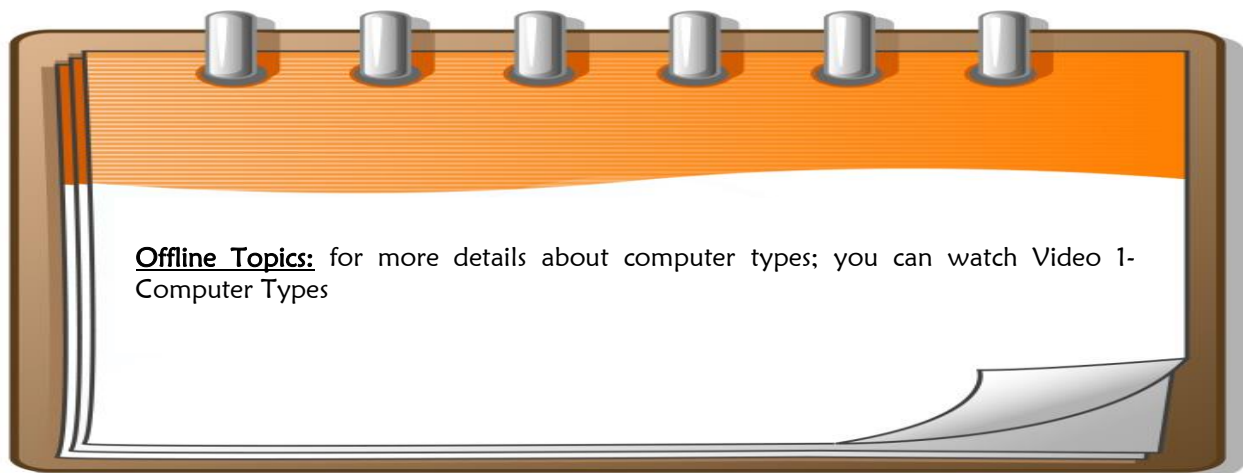
1. What are the Concepts of Computer and Information Technology?

1.1 Computer: A computer is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use.

1.2 Information Technology (IT): is the use of any computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data.

2. What are the Different Types of Computers?

When most people hear the word computer, they think of a personal computer such as a desktop or laptop. However, computers come in many shapes and sizes, and they perform many different functions in our daily lives. When you withdraw cash from an ATM, scan groceries at the store, or use a calculator, you're using a type of computer.

Offline Topics: for more details about computer types; you can watch Video 1- Computer Types

3. Computer Hardware and Software

Pieces and Parts—Computer Hardware We'll start by looking at the physical components of your system such as the keyboard or mouse. It also includes all of the computer's internal parts. As you can see in Fig. 1.1, there are a lot of different pieces and parts that make up a typical computer system. The physical components include both input and output devices, the basic parts of a desktop computer are the **computer case**, **monitor**, **keyboard**, **mouse**, and **power cord**. Each part plays an **important role** whenever you use a computer.
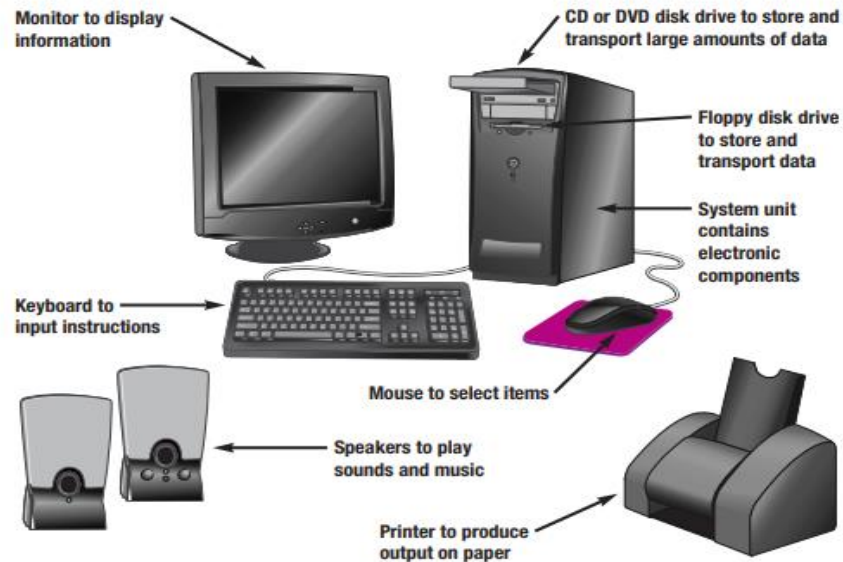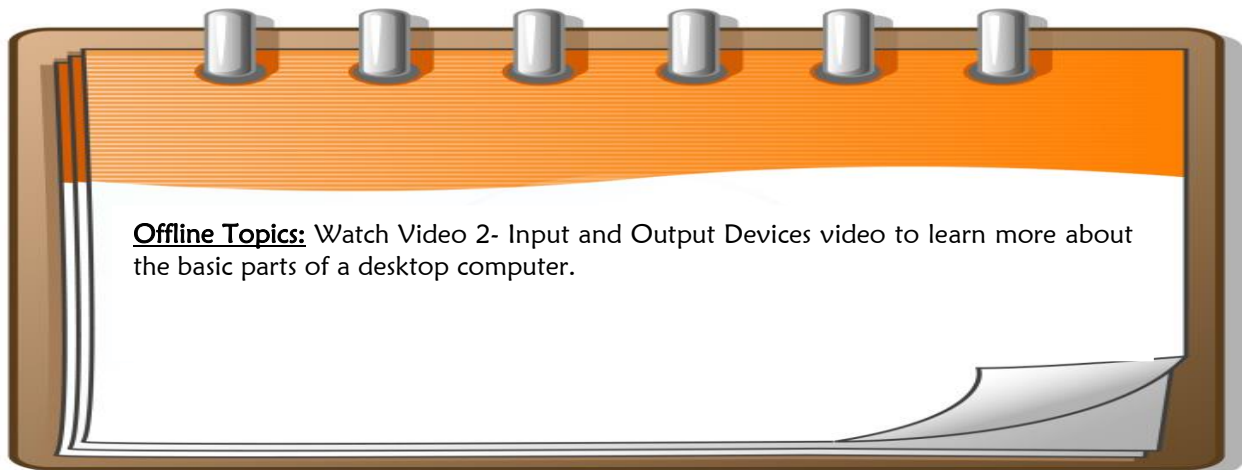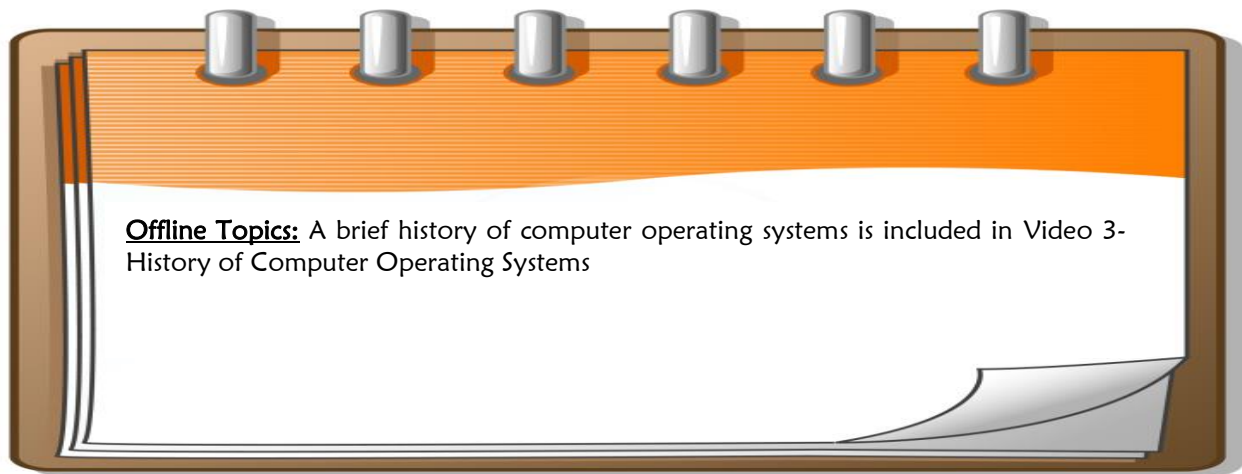
Figure 1.1: Computer hardware; input and output devices.

Offline Topics: Watch Video 2- Input and Output Devices video to learn more about the basic parts of a desktop computer.

Software, is any **set of instructions** that tells the hardware **what to do** and **how to do it**. In most cases, the words software and programs are interchangeable. There are two major kinds of software—system software and application software. You can think of application software as the kind you use. Think of system software as the kind the computer uses.

1.   SYSTEM SOFTWARE The user interacts primarily with application software. System software enables the application software to interact with the computer hardware. System software is "background" software that helps the computer manage its own internal resources. System software is not a single program. Rather it is a collection of programs:

- Operating systems; are programs that coordinate computer resources, provide an interface between users and the computer, and run applications. Windows XP and the Mac OS X are two examples of operating systems.

Offline Topics: A brief history of computer operating systems is included in Video 3- History of Computer Operating Systems

- Utilities, also known as service programs, perform specific tasks related to managing computer resources. For example, the Windows utility called Disk Defragmenter locates and eliminates unnecessary file fragments and rearranges files and unused disk space to optimize computer operations.
- Device drivers; are specialized programs designed to allow particular input or output devices to communicate with the rest of the computer system.

2.   APPLICATION SOFTWARE Application software might be described as end user software. These programs can be categorized as either <u>desktop applications</u> or <u>mobile applications.</u>

- Desktop applications; There are countless desktop applications, and they fall into several categories. Some are fuller featured (like Microsoft Word), while others may only do one or two things (like a clock or calendar app). Below are just a few types of applications you might use.

A. Word processors: A word processor allows you to write a letter, design a flyer, and create many other types of documents. The most well-known word processor is Microsoft Word, see fig. 1.2. It will be discussed and covered in details in chapter 4.
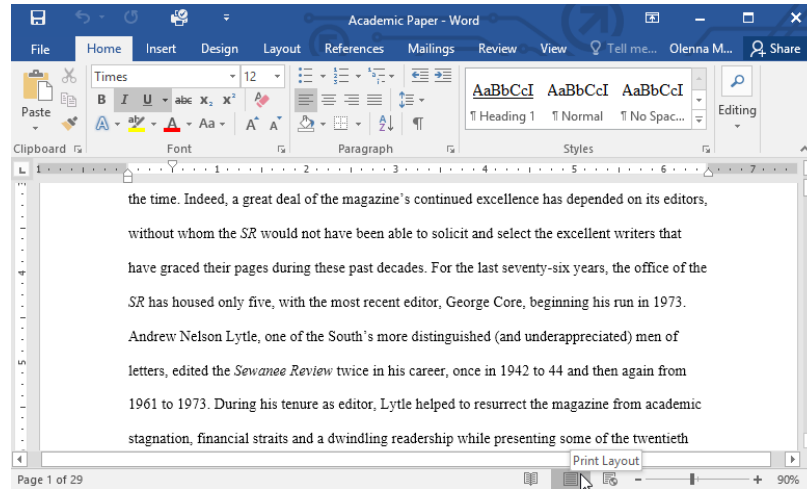

Figure 1.2: Word processor

B. Web browsers: A web browser is the tool you use to access the Internet. Most computers come with a web browser pre-installed, but you can also download a different one if you prefer. Examples of browsers include Internet Explorer, Mozilla Firefox, Google Chrome as in fig. 1.3, and Safari.

Figure 1.3: Google Chrome web browser

C. Media players: If you want to listen to MP3s or watch movies you've downloaded, you'll need to use a media player. Windows Media Player, see fig. 1.4 and iTunes are popular media players.
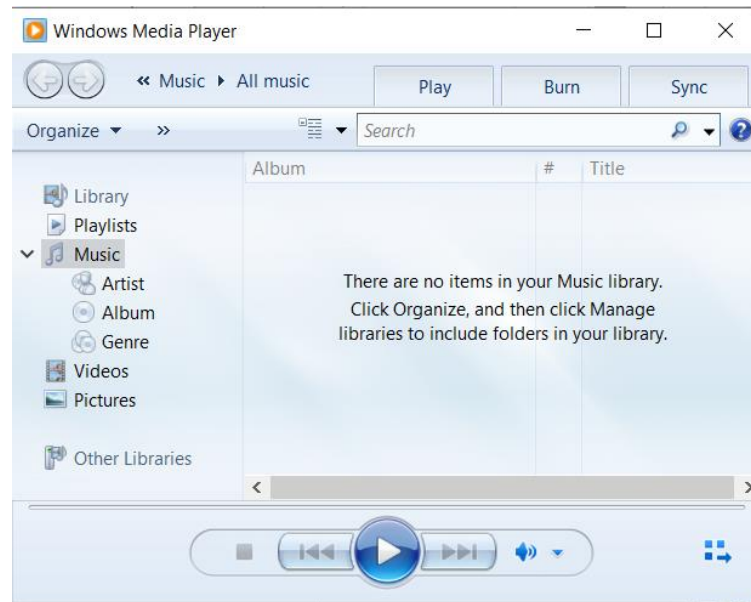

Figure 1.4: Windows media player

D. Games: There are many types of games you can play on your computer. They range from card games like Solitaire to action games like Halo. Many action games require a lot of computing power, so they may not work unless you have a newer computer.

- Mobile apps; Desktop and laptop computers aren't the only devices that can run applications. You can also download apps for mobile devices like smartphones and tablets. Here are a few examples of mobile apps.

A. Gmail: You can use the Gmail app to easily view and send emails from your mobile device. It's available for Android and iOS devices.
B. Instagram: You can use Instagram to quickly share photos with your friends and family. It's available for Android and iOS.
C. Duolingo: With a combination of quizzes, games, and other activities, this app can help you learn new languages. It's available for Android and iOS.

4.   Concepts of Data and Information

Data are raw, unprocessed facts, including text, numbers, images, and sounds. Processed data becomes information. When stored electronically in files, data can be used directly as input for the information system. Four common types of files are shown in fig. 1.5, they are:

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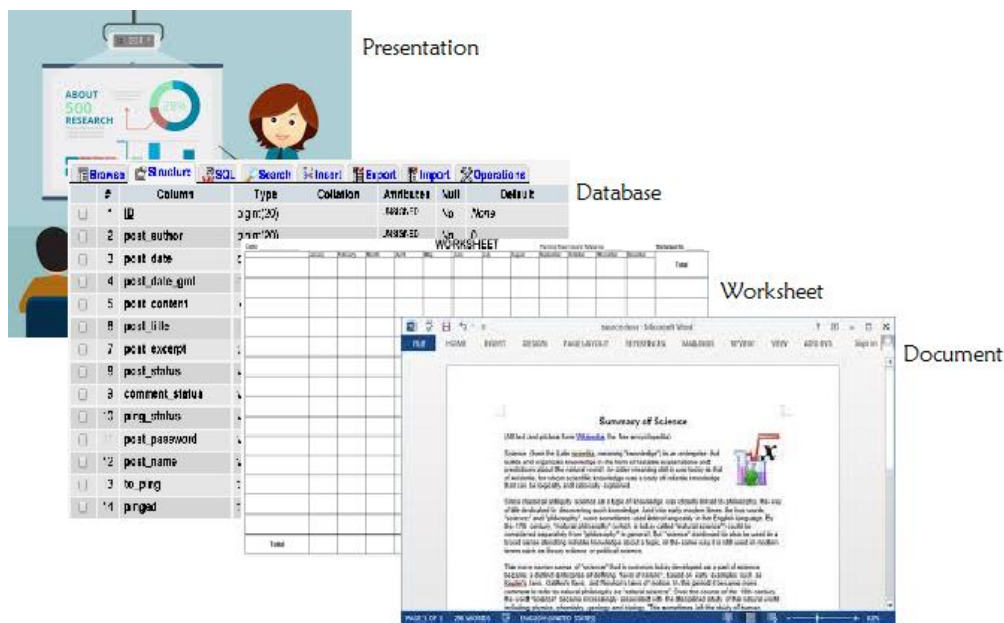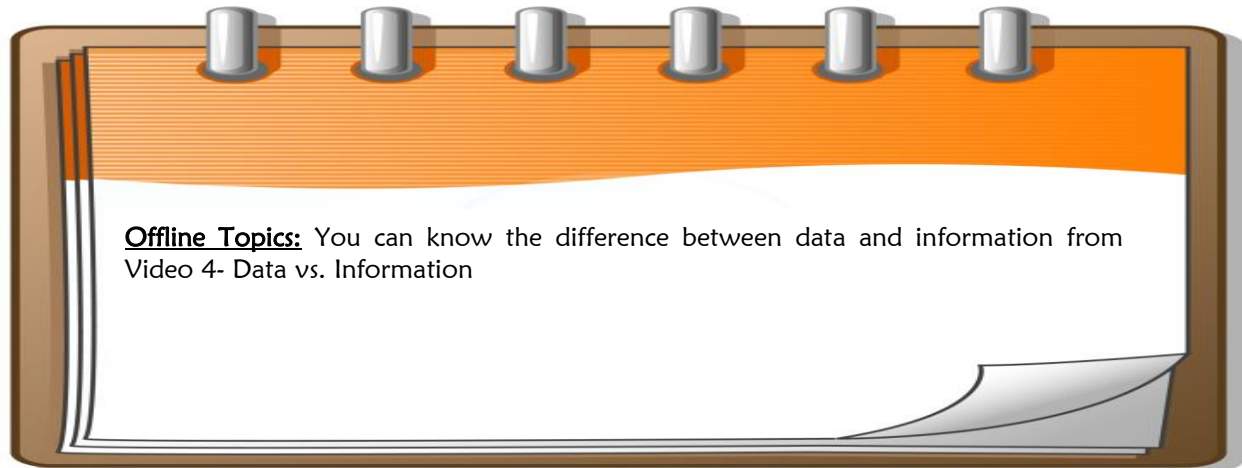

Figure 1.5: Four types of files: presentation, database, worksheet, and document

When data is processed, organized, structured or presented in a given context so as to make it useful, it is called information.

Offline Topics: You can know the difference between data and information from Video 4- Data vs. Information

5.   Data Processing & Data Processing Stages

Data processing is a process of converting raw facts or data into a meaningful information.

5.1 Stages of Data Processing

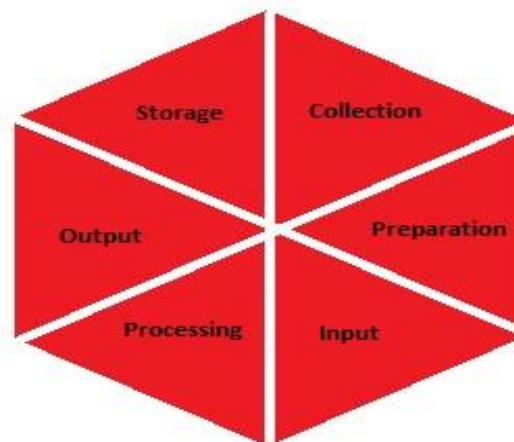Data processing consists of the following 6 stages as shown in fig. 1.6:

Figure 1.6: Data processing stages.

1. Collection

Collection of data refers to gathering of data. The data gathered should be defined and accurate, see fig. 1.7.

Figure 1.7: Data collection.

2. Preparation

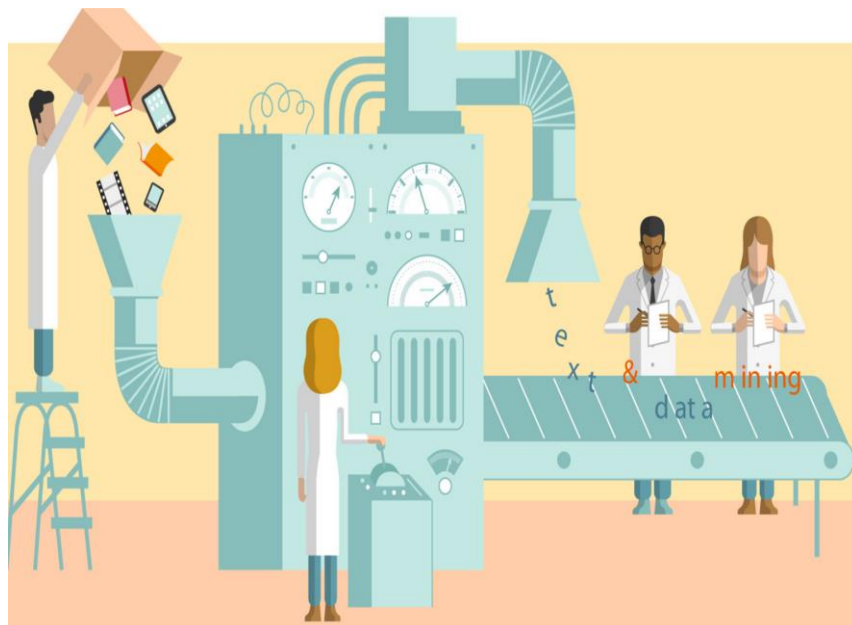Preparation is a process of constructing a dataset of data from different sources for future use, see fig. 1.8.

Figure 1.8: Data Preparation.

3. **Input**

Input refers to supply of data for processing. It can be fed into computer through any of input devices like keyboard, scanner, mouse, etc., see fig. 1.9.

Figure 1.9: Data input

4. **Processing**

The process refers to concept of an actual execution of instructions. In this stage, raw facts or data is converted to meaningful information, see fig. 1.10.

Figure 1.10: Data processing.

5. Output and Interpretation

In this process, output will be displayed to user in form of text, audio, video, etc. Interpretation of output provides meaningful information to user, see fig. 1.11.

Figure 1.11: Data output.

6. Storage

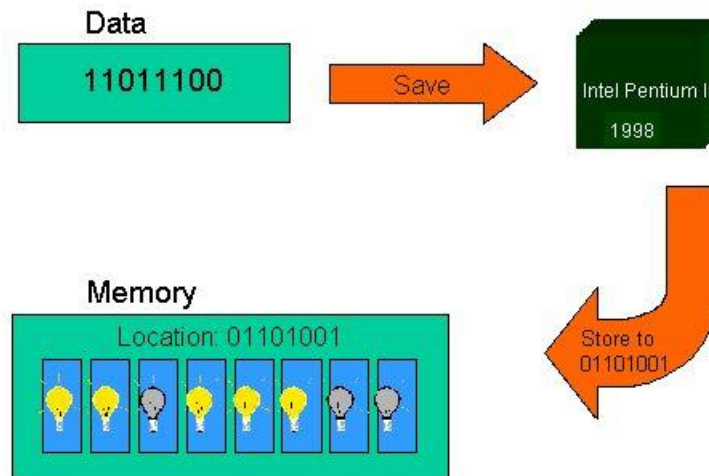In this process, we can store data, instruction and information in permanent memory for future reference, see fig. 1.12.

Figure 1.12: Data storage.