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## Unit 1

# Concepts in Information Technology

Before reading further, we will make an assumption that you could have seen or used a computer before in your life. In this activity you will be asked to do the following:-

1. Give a definition of a computer from your own understanding of what a computer is.
2. Give reasons why organizations and individuals use computers in their operations.
3. State what could be the use of the following parts of a computer:
  - a) Monitor
  - b) Keyboard
  - c) Mouse

It is good that you have attempted to provide answers to the questions above. Using the answers that you have given, try to compare the answers you provided with the ones we will be covering in a short while.

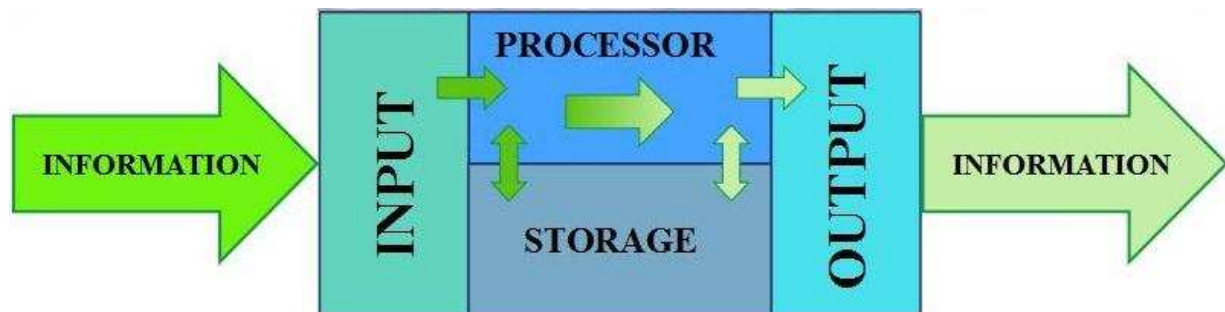
### What is a computer?

A computer is a device that works under the control of stored programs, automatically accepting, storing and processing data to produce information that is the result of that processing.

A computer system is a set of components connected together which are capable of;

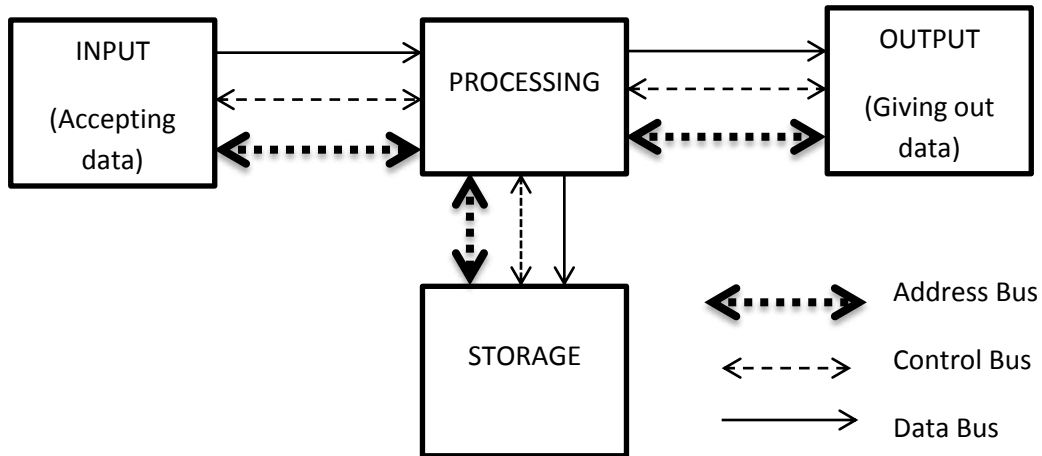
- i) Accepting data from the outside world.
- ii) Processing the data under the influence of stored program.
- iii) Giving output in the form of information.
- iv) Providing storage when required.

The diagram below shows the four components of a computer system and how information is processed.



**Figure 1.** Components of a computer

The diagram below shows the four components of a computer system and buses.



**Figure 2.** Components of a computer and buses

The components are connected together to the motherboard through cables as buses. There are three types of buses;

1. Data buses: These are used to transport data and information within the computer.
2. Control bus: These are used to transport control messages within the computer system.
3. Address bus: These are used to exchange addresses between communicating devices.

## HISTORY AND DEVELOPMENT OF COMPUTERS

There are several methods of classifying computers; computers can be classified by the way they process data, their purpose and use and they can also be classified by age of technology.

### Basic Types of computers

The basic types of computers are **Digital**, **Analog** and **Hybrid**.

#### Digital Computers

These are computers which process data that is represented in the form of discrete values (e.g. 0, 1, 2, 3 ..... ) by operating on it in steps. Discrete values occur at each step in the operation. Counting on one's fingers is probably the simplest digital operation we all know. Digital watches have special, tiny, digital computers within them.

#### Analog Computers

These are computers which are kin to measuring instruments such as thermometers and voltmeters with pointers on circular dials. They process data in the form of electrical voltages, which are variable like the variable positions of a pointer on a dial. The output from analog computers is often in the form of smooth graphs from which information can be read.

#### Hybrid Computers

These are computers that have the combined features of digital and analog computers.

**NOTE:** In this module we are going to concentrate on digital computers which are the ones used widely in business organizations.

## GENERATION OF COMPUTERS

As the time passed, the device of more suitable and reliable machine was needed which could perform our work more quickly. During this time, in the year 1946, the first successful electronic computer called ENIAC was developed and it was the starting point of the current generation of computer.

### First Generation

ENIAC was the world's first successful electronic computer which was developed by the two scientists, namely J. P. Eckert and J. W. Mauchly. It was the beginning of the first generation computer. The full form of ENIAC is "Electronic Numerical Integrator and Calculator." ENIAC was a very huge and big computer and its weight was 30 tons. It could store only a limited or small amount of information. Initially, in the first generation computer, the concept of vacuum tubes was used. A vacuum tube was such an electronic component which had very less work efficiency and so it could not work properly and it required a large cooling system. The diagram below shows the ENIAC computer.



**Figure 3.** ENIAC computer

### Second Generation

As the development moved further, the second generation of computers knocked the door. In this generation, transistors were used as the electronic component instead of vacuum tubes. A transistor is much smaller in size than that of a vacuum tube. As the size of electronic components decreased from vacuum tube to transistor, the size of the computer also decreased and it became much smaller than that of the earlier computer.



**Figure 4.** Transistor Machine

### **Third Generation**

The third generation computers were invented in the year 1964. In this generation of computer, IC (Integrated circuits) was used as the electronic component for computers. The development of IC gave birth to a new field of microelectronics. The main advantage of IC is not only its small size but its superior performance and reliability than the previous circuits. It was first developed by T.S Kilby. This generation of computer has huge storage capacity and higher calculating speed.



**Figure 5.** Integrated Circuits

### **Fourth Generation**

This is the generation where we are working today. The computers which we see around us belong to the fourth generation computers. 'Microprocessor' is the main concept behind this generation of computer.

A microprocessor is a single chip (L.S.I circuit), which is used in a computer for any arithmetical or logical functions to be performed in any program. The honor of developing microprocessor goes to Ted Hoff of U.S.A. He developed first micro-processor, the Intel 4004, as he was working for Intel Corporation, U.S.A with the use of microprocessor in the fourth generation computers, the size of computer become very fast and efficient. It is evident that the next generation of computer i.e. fifth generation will be developed soon. In that generation, computer will possess artificial intelligence and it would be able to take self-decisions like a human being. Figure 6 shows a desktop computer.



**Figure 6.** Desktop Computer

### **CLASSIFICATIONS OF COMPUTERS**

There are basically four classes of computers. These are Supercomputer, Mainframe, Minicomputer and Microcomputer

#### **Supercomputer**

The fastest and most powerful type of computer. Supercomputers are very expensive and are employed for specialized applications that require immense amounts of mathematical calculations. For example, weather forecasting requires a supercomputer. Other uses of supercomputers include animated graphics, fluid dynamic calculations, nuclear energy research, and petroleum exploration.

The chief difference between a supercomputer and a mainframe is that a supercomputer channels all its power into executing a few programs as fast as possible, whereas a mainframe uses its power to execute many programs concurrently.

#### **Mainframe Computer**

A very large and expensive computer capable of supporting hundreds, or even thousands, of users simultaneously. In the hierarchy that starts with a simple microprocessor (in watches, for example) at the bottom and moves to supercomputers at the top, mainframes are just below supercomputers. In some ways, mainframes are more powerful than supercomputers because they support more simultaneous programs. But supercomputers can execute a single program faster than a mainframe.

#### **Minicomputer**

A mid-sized computer. In size and power, minicomputers lie between *workstations* and *mainframes*. In the past decade, the distinction between large minicomputers and small mainframes has blurred, however, as has the distinction between small minicomputers and workstations. But in general, a minicomputer is a multiprocessing system capable of supporting from 4 to about 200 users simultaneously.

#### **Comparison between Mainframes and Minicomputers**

- **Cost:-** The minicomputers are small in size as compared to mainframe computers.

- **Physical size:-** The minicomputers are small in size as compared to mainframe computers.
- **Peripherals:-** The minicomputers have a less number of peripherals as compared to mainframes.
- **Performance:-** The performance of minicomputers is better than that of a mainframe computer.

### Microcomputers (Personal computers)

Microcomputers are the most common type of computers used by people today, whether in a workplace, at school or on the desk at home. The term “microcomputer” was introduced with the advent of single chip microprocessors. The term "microcomputer" itself is now practically an anachronism.

These computers include:

- **Desktop computers** – A case and a display, put under and on a desk.
- **In-car computers (“carputers”)** – Built into a car, for entertainment, navigation, etc.
- **Game consoles** – Fixed computers specialized for entertainment purposes (video games).

A separate class is that of mobile devices:

- **Laptops, notebook computers and Palmtop computers** – Portable and all in one case. Varying sizes, but other than smartbooks expected to be “full” computers without limitations.
- **Tablet computer** – Like laptops, but with a touch-screen, sometimes entirely replacing the physical keyboard.
- **Smartphones, smartbooks and PDAs (personal digital assistants)** – Small handheld computers with limited hardware.
- **Programmable calculator**– Like small handhelds, but specialized on mathematical work.
- **Handheld game consoles** – The same as game consoles, but small and portable.

### Advantages of Microcomputers

There are a number of advantages that merit the use of microcomputers in the business environment.

These are:

- They enable users to do their work timely and effectively without hiring the computer professional staff as would be the case with mainframes and minicomputers.
- The purchase price is far less than that of mainframes and minicomputers.
- They are easy to install and operate.
- They cost less in terms of installation, maintenance and operations (running).
- They are portable.

### Disadvantages of Microcomputers

- Users tend to develop duplicate programs to satisfy their departmental needs.
- Software and hardware purchases are done without looking at the overall organizational requirements.
- Security of data, software and hardware is often compromised.

## **BASIC FUNCTIONS OF A COMPUTER**

Let us examine the hardware function of a computer. We are going to look at the basic elements of a computer in terms of function. The majority of digital computers conform to this view even though they may differ greatly in terms of the particular hardware components used to provide these functions. It is therefore a very useful way for us to deal with what a computer is in general terms.

The basic elements that make up a computer are as follows:

- Input
- Storage
- Control
- Processing
- Output

These basic elements are described below giving examples of each.

### **INPUT**

The purpose of the input components of a computer system is:

- To accept data/instructions in the required form.
- To convert this data/instructions to a machine understandable form.
- To transmit this data/instruction to the Central Processing Unit.

#### **Input devices.**

To input data or instructions there are a number of devices that are used. These will be explained and benefits with drawbacks of these devices will be highlighted to give you a better chance of understanding the various input devices used.

##### **1. Keyboard**

A keyboard is an input device. It is made up of a systematic arrangement or layout of keys that are used to encode data into a computer. In other words, it is a hardware unit with a set of switches that resembles a typewriter keyboard and that conveys information from a user to a computer or data communications circuit. It consists of many keys; - Alt key, arrow key, Backspace key, Break key, Caps Lock key, character keys, Control key, Delete key, End key, Enter key, Escape key, function keys, Home key, Insert key, numeric keypad, Num Lock key, Page Down key, Page Up key, Pause key, Power-on key, Print Screen key, Scroll Lock key, Shift key, Tab key etc. A user of a computer uses several of these keys to complete a task especially when using word processing software like Microsoft Word. Some of these keys are used to enable and disable some hardware on computers. Some advanced users are able to do all their daily work with a keyboard only. A keyboard uses a PS/2 port to connect to a computer. Modern keyboards use USB technology and a few have incorporated Bluetooth wireless.

##### **2. Mouse**

A mouse is a pointing device that allows a computer user to be able to select icons and menus on the interface of a computer screen. It has a round case designed to be held by one hand with a right and left key for clicking. It also has a bottom sensitive directional component known as a trackball which allows the pointer to navigate over menus and windows on the screen. Most mice connected to the computer using a PS/2 port. However the technology of using USB has overtaken the PS/2 in modern computers. Most mice made nowadays are connecting to



computers using USB technology. Others just like keyboards are using Bluetooth wireless technology.

### 3. **Magnetic Ink Character Recognition (MICR)**

**Magnetic Ink Character Recognition**, or **MICR**, is a character recognition technology used primarily by the banking industry to facilitate the processing of cheques and makes up the routing number and account number at the bottom of a cheque. The technology allows computers to read information (such as account numbers) off printed documents. Unlike barcodes or similar technologies, however, MICR codes can be easily read by humans. MICR characters are printed in special typefaces with a magnetic ink or toner, usually containing iron oxide. As a machine decodes the MICR text, it first magnetizes the characters in the plane of the paper. Then the characters are passed over a MICR read head, a device similar to the playback head of a tape recorder. As each character passes over the head it produces a unique waveform that can be easily identified by the system.

### 4. **Optical Character Recognition (OCR)**

**Optical character recognition**, usually abbreviated to **OCR**, is the mechanical or electronic conversion of scanned images of handwritten, typewritten or printed text into machine-encoded text. It is widely used as a form of data entry from some sort of original paper data source, whether documents, sales receipts, mail, or any number of printed records. It is a common method of digitizing printed texts so that they can be electronically searched, stored more compactly, displayed on-line, and used in machine processes such as machine translation, text-to-speech and text mining. OCR is a field of research in pattern recognition, artificial intelligence and computer vision.

### 5. **Optical Mark Recognition (OMR)**

**Optical Mark Recognition** (also called **Optical Mark Reading** and **OMR**) is the process of capturing human-marked data from document forms such as surveys and tests. Many traditional OMR (Optical Mark Recognition) devices work with a dedicated scanner device that shines a beam of light onto the form paper. The contrasting reflectivity at predetermined positions on a page is then used to detect the marked areas because they reflect less light than the blank areas of the paper.

### 6. **Bar-code Readers**

A **barcode reader** (or **barcode scanner**) is an electronic device for reading printed barcodes. Like a flatbed scanner, it consists of a light source, a lens and a light sensor translating optical impulses into electrical ones. Additionally, nearly all barcode readers contain *decoder* circuitry analyzing the barcode's image data provided by the sensor and sending the barcode's content to the scanner's output port.

### 7. **Light Pen**

A **light pen**, also called a **selector pen**, is a computer input device in the form of a light-sensitive wand used in conjunction with a computer's CRT display. It allows the user to point to displayed objects or draw on the screen in a similar way to a touchscreen but with greater positional accuracy. It was long thought that a light pen can work with any CRT-based display, but not with LCDs (though Toshiba and Hitachi displayed a similar idea at the "Display 2006" show in Japan and other display technologies. However, in 2011 Fairlight Instruments released its Fairlight CMI-30A, which uses a 17" LCD monitor with light pen control.

## 8. *Smart cards*

A **smart card, chip card, or integrated circuit card (ICC)** is any pocket-sized card with embedded integrated circuits. Smart cards are made of plastic, generally polyvinyl chloride, but sometimes acrylonitrile butadiene styrene or polycarbonate. Smart cards can provide identification, authentication, data storage and application processing. Smart cards may provide strong security authentication for single sign-on (SSO) within large organizations.

## 9. *Touch screens*

A **touchscreen** is an electronic visual display that can detect the presence and location of a touch within the display area. The term generally refers to touching the display of the device with a finger or hand. Touchscreens can also sense other passive objects, such as a stylus. Touchscreens are common in devices such as game consoles, all-in-one computers, tablet computers, and smartphones.

The touchscreen has two main attributes. First, it enables one to interact directly with what is displayed, rather than indirectly with a pointer controlled by a mouse or touchpad. Secondly, it lets one do so without requiring any intermediate device that would need to be held in the hand (other than a stylus, which is optional for most modern touchscreens). Such displays can be attached to computers, or to networks as terminals. They also play a prominent role in the design of digital appliances such as the personal digital assistant (PDA), satellite navigation devices, mobile phones, and video games.

## **STORAGE**

Storage Devices are the data storage devices that are used in the computers to store the data. The computer has many types of data storage devices. Some of them can be classified as the removable data Storage Devices and the others as the non-removable data Storage Devices.

The memory is of **two types**; one is the **primary memory** and the other one is the **secondary memory**.

The primary memory is the volatile memory and the secondary memory is the non-volatile memory. The volatile memory is the kind of the memory that is erasable and the non-volatile memory is the one where in the contents cannot be erased. Basically when we talk about the data storage devices it is generally assumed to be the secondary memory.

The secondary memory is used to store the data permanently in the computer. The secondary storage devices are usually as follows: hard disk drives – this is the most common type of storage device that is used in almost all the computer systems. The other ones include the floppy disk drives, the CD ROM, and the DVD ROM. The flash memory, the USB data card etc.

### 1. **Hard drive**

A hard disk drive is the device used to store large amounts of digital information in computers and related equipment like iPods and games consoles such as the Xbox 360 and PS3. Hard disk drives are used to store operating systems, software and working data. These are suitable for any application which requires very fast access to data for both reading and writing to. However, Hard disk drives may not be suitable for applications which need portability. Almost all computers used a fixed hard disc. Used for on-line and real time processes requiring direct access. Used in file servers for computer networks to store large amount of data.

## 2. Floppy diskette

A floppy disk is a data storage medium that is composed of a disk of thin, flexible floppy magnetic storage medium encased in a square or rectangular plastic shell. Floppy disks are read and written by a floppy disk drive.

### Application

Any use where small files such as word processing, small spreadsheets and databases need to be moved from one computer to another. It cannot store files large than 1.42MB because that is its maximum storage size. It was useful in backing up small data files however it has been overtaken by the USB flash drives which are very flexible.

## 3. USB flash drive

USB flash drives are typically removable and rewritable, much smaller than a floppy disk. Storage capacities typically range from 64 MB to 64 GB. USB flash drives offer potential advantages over other portable storage devices, particularly the floppy disk. They have a more compact shape, operate faster, hold much more data, have a more durable design, and operate more reliably due to their lack of moving parts. Flash drives are widely used to transport files and backup data from computer to computer.

## 4. DVD/CD

CDs tend to be used for large files (but smaller 700MB) which are too big for a floppy disc to hold such as music and general animation. A CD is about 700MB in size.

DVDs are used to hold very large files (4.7 GB and more) such as movie films. Both CDs and DVDs are portable i.e. they can be transported from one computer to another. Both can be used to store computer data.

CD ROM/DVD ROM Applications which require the prevention of deletion of data, accidental or otherwise. CDs used by software companies for distributing software programs and data; by Music companies for distributing music albums and by book publishers for distributing encyclopaedias, reference books etc. DVDs used by film distributors.

CD R/DVD R Applications which require a single 'burning' of data, e.g. CDs - recording of music downloads from the Internet, recording of music from MP3 format, recording of data for archiving or backup purposes. DVDs – recording of film movies and television programs.

CD RW/DVD RW Applications which require the updating of information and ability to record over old data. Not suitable for music recording but is very useful for keeping generations of files. DVDs have between five and ten times the capacity of CDs.

## 5. Magnetic Tape

Magnetic tape has been used for data storage for over 50 years. When storing large amounts of data, tape can be substantially less expensive than disk or other data storage options. Tape storage has always been used with large computer systems. Modern usage is primarily as a high capacity medium for backups and archives.

## Drawbacks

Writing and retrieving data is slow.  
It uses serial access for reading and writing.

## Application

Magnetic tapes are used for application which requires extremely large storage capacity where speed of access is not an issue.

It is commonly used for backups of file servers for computer networks, in a variety of batch processing applications such as reading of bank cheques, payroll processing and general stock control.

## 6. RAM

**Random Access Memory (RAM)** is a form of computer data storage. A random access device allows stored data to be accessed in any order in very nearly the same amount of time for any storage location or size of memory device. A device such as a magnetic tape requires increasing time to access data stored on parts of the tape that are far from the ends. Memory devices (such as floppy discs, CDs and DVDs) can access the storage data only in a predetermined order, because of mechanical design limitations; the time to access a given part of the device varies significantly due to its physical location.

Today, random-access memory takes the form of integrated circuits. Strictly speaking, modern types of DRAM are not random access, as data is read in bursts, although the name DRAM / RAM has stuck. However, many types of SRAM, ROM, OTP, and NOR flash are still random access even in a strict sense. RAM is often associated with volatile types of memory (such as DRAM memory modules), where its stored information is lost if the power is removed. Many other types of non-volatile memory are RAM as well, including most types of ROM and a type of flash memory called *NOR-Flash*. The first RAM modules to come into the market were created in 1951 and were sold until the late 1960s and early 1970s.

## 7. ROM

**Read-only memory (ROM)** is a class of storage medium used in computers and other electronic devices. Data stored in ROM cannot be modified, or can be modified only slowly or with difficulty, so it is mainly used to distribute firmware (software that is very closely tied to specific hardware, and unlikely to need frequent updates).

In its strictest sense, **ROM** refers only to mask ROM (the oldest type of solid state ROM), which is fabricated with the desired data permanently stored in it, and thus can never be modified. Despite the simplicity, speed and economies of scale of mask ROM, field-programmability often make reprogrammable memories more flexible and inexpensive. As of 2007, actual ROM circuitry is therefore mainly used for applications such as microcode, and similar structures, on various kinds of processors.

Other types of non-volatile memory such as Programmable Read Only Memory (PROM), Erasable Programmable Read Only Memory (EPROM) and Electrically Erasable Programmable Read-Only Memory (EEPROM or Flash ROM) are sometimes referred to, in an abbreviated way, as "read-only memory" (ROM); although these types of memory can be erased and re-programmed multiple times, writing to this memory takes longer and may require different procedures than reading the memory. When used in this less precise way, "ROM" indicates a

*non-volatile* memory which serves functions typically provided by mask ROM, such as storage of program code and nonvolatile data.

PROM (Programmable Read Only Memory) is a type of memory which can be programmed only once. PROMs are bought without programs (empty). They are programmed by the user special equipment but once they are programmed, the contents cannot be changed. PROMs can only be programmed once. Of course, users would require chips that can be erased and reprogrammed. This demand led to the development of erasable PROMs. The erasable programmable read-only memory (EPROM) is usually not programmed by the manufacturer. Once they are programmed, EPROMs require ultra-violet light and some special equipment in order for their contents to be erased. This is a vital safeguard against accidental erasure. An EEPROM is an electrically erasable PROM.

#### 8. Flash memory cards

A **memory card** or **flash memory card** is a solid-state electronic flash memory data storage device used with digital cameras, handheld and Mobile computers, telephones, music players, video game consoles, and other electronics.

Nowadays, most new PCs have built-in slots for a variety of memory cards; Memory Stick, CompactFlash, SD, etc. Some digital gadgets support more than one memory card to ensure compatibility.

## PROCESSING

### A short history of processors

IBM, Intel and AMD are the pioneers in the field of microprocessor manufacturing. All these latest computer processor gained immense popularity after the 1980s as there was great development in the field of computers and technology. Intel 4004 was the first ever single-chip 4-bit microprocessor and it was released on November 15, 1971. The first 8-bit processor was 8008 and it released on April 1, 1972. Processors such as Intel 8080, 8085, 8086, 8088, 80186, 80188 and 80286 followed in the forthcoming decade.

The 80s saw the rise of 32-bit processors namely, the Intel 80386, 80376, 80486. Next came the landmark Pentium series of Intel. Pentium I, II, Celeron, III and IV processors proved to be effective too and found a lot of customers worldwide. In fact, personal computer systems became affordable after the Pentium III processor came into existence. 64-bit generators were created by Intel under the Core Series. **Core 2 Duo Processor**, Intel **Dual Core Processors** etc are now used by many people all over the world.

AMD (Advanced Micro Devices) entered the scene of microprocessor devices in the 1975 with the AM 2900 series. AM 2901 to 2914 were manufactured in the same year followed by 29000 microprocessors from 1987-95. AMD came up with high end microprocessors in the year 2003 with the production of the K8 series which included the **Opteron Processor**, Athlon 64, **Turion Processors**, Athlon 64 X2 and Turion 64 X2 families. The Phenom family was released in 2008 and was followed with upgraded versions such as Phenom X3 and Phenom II series. AMD has planned to come up with the Fusion microprocessor

which combines general processor execution with 3D geometry processing and all other functions of GPUs together. This is being produced by AMD with the collaboration of ATI.

### **What is the processor?**

The processor is the brain of the computer. The processor may be defined as follows; it's the nerve centre of the entire computer system as it is in charge of all the operations of the machine. It is divided into three elements namely:

- Arithmetic and logic unit
- Control unit
- Main store or memory

The processing unit may have all its elements – arithmetic and logic unit, control unit, and the input/output interface on a single “chip”. A chip is a small piece of silicon upon which is etched an integrated circuit, on an extremely small scale.

The chip is mounted on a carrier unit which in turn is ‘plugged’ onto a circuit board – called the motherboard – with other chips, each with their own functions.

The most common chips are those made by Intel Company. Each generation of Intel CPU chip has been able to perform operations in fewer clock cycles than the previous generation, and therefore works more quickly.

**Microprocessor:** A microprocessor is a component of the computer’s central processing unit (CPU) and contains circuitry for controlling the entire computer system, for performing arithmetic and logic operations, for controlling input and output and also memory circuitry. Usually, the microprocessor circuitry is contained on a single silicon chip. The microprocessor interprets and executes all the instructions in the computer system.

All chips containing circuitry that controls the computer and also the computer memory chips are found on the system board. The motherboard, also called the main board, is a circuit board whose task is to link all the other chips of the computer. Any expansion boards that should be installed in the computer are fitted into expansion slots which hold the boards in place. The slots also give the boards an electronic link to the motherboard

A chip is a small piece of silicon material which contains microcircuit elements.

An integrated circuit (IC) is combination of circuit elements that are interconnected and placed on a small chip of silicon. The IC chip is then mounted on to a carrier unit that is itself plugged on a circuit board with other chips. Although they are put together on one circuit board, each IC chip performs its own functions.

### **MHz and clock speed**

The processor receives program instructions and sends signals to peripheral devices. The signals are coordinated by a clock which sends out a “pulse” – a sort of tick-tock sequence called a cycle – at regular intervals

The number of cycles produced per second is usually in MegaHertz (MHz) or GigaHertz (GHz)

- 1 MHz = one million cycles per second

· 1 GHz = one billion cycles per second  
A typical modern business PC might run on 2 GHz.

### Memory

The computer's memory is also known as main store or internal store. The memory will hold the following.

- Program instructions
- The input data that will be processed next
- The data that is ready for output to an output device

Figure 7 below shows two Processors (CPUs) used in Desktop computers.



**Figure 7.** An Intel Core 2 Quad and AMD 64 Athlon X 2 processors

### OUTPUT

An output device is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing system (such as a computer) which converts the electronically generated information into human-readable form.

#### Types of output

Some types of output are text, graphics, tactile, audio, and video. Text consists of characters (letters, numbers, punctuation marks, or any other symbol requiring one byte of computer storage space) that are used to create words, sentences, and paragraphs. Graphics are digital representations of nontext information such as drawings, charts, photographs, and animation (a series of still images in rapid sequence that gives the illusion of motion). Tactile output such as raised line drawings may be useful for some individuals who are blind. Audio is music, speech, or any other sound. Video consists of images played back at speeds to provide the appearance of full motion

#### Output device

These examples of output devices include printers, visual displays (monitors and projectors) and speakers.

## Printers

In computing, a **printer** is a peripheral which produces a text or graphics of documents stored in electronic form, usually on physical print media such as paper or transparencies. Many printers are primarily used as local peripherals, and are attached by a printer cable or, in most new printers, a USB cable to a computer which serves as a document source. Some printers, commonly known as *network printers*, have built-in network interfaces, typically wireless or Ethernet based, and can serve as a hard copy device for any user on the network. Individual printers are often designed to support both local and network connected users at the same time. In addition, a few modern printers can directly interface to electronic media such as memory cards, or to image capture devices such as digital cameras and scanners; some printers are combined with scanners or fax machines in a single unit, and can function as photocopiers. Printers that include non-printing features are sometimes called multifunction printers (MFP), multi-function devices (MFD), or all-in-one (AIO) printers. Most MFPs include printing, scanning, and copying among their many features. Figure 8 shows a multifunction printer.



**Figure 8.** A modern printer with scanning and photocopying capabilities

## Monitor

A **monitor** or **display** (also called **screen** or **visual display unit**) is an electronic visual display for computers. The monitor comprises the display device, circuitry, and an enclosure. The display device in modern monitors is typically a thin film transistor liquid crystal display (TFT-LCD) thin panel, while older monitors use a cathode ray tube (CRT) about as deep as the screen size.



**Figure 9.** LCD Monitor



**Figure 10.** CRT Monitor



### **Advantages of LCD monitors over CRT monitors**

There are important differences to consider between liquid crystal display (LCD) and cathode ray tube (CRT) monitors. Some advantages of LCD monitors include:

- LCD monitors consume less power. An average 19-inch LCD uses 45 watts of electricity, while a 19-inch CRT uses 100 watts.
- LCD monitors are smaller, thinner and weigh half as much as CRTs. This allows you to mount an LCD on a wall or an arm.
- An LCD monitor's tilt, swivel, height and orientation from horizontal to vertical can all be adjusted easily.
- LCD monitors don't produce the flicker that CRTs do, generating less eye strain.
- LCDs display text much more clearly than CRTs.

### **Projectors**

A projector is an optical device that projects a beam of light, especially one used to project an image (or moving images) onto a screen. Figure 11 below shows a projector.



**Figure 11.** Projector

### **Speakers**

Computer speakers, or multimedia speakers, are speakers external to a computer that disable the lower fidelity built-in speaker. They often have a low-power internal amplifier. The standard audio connection is a 3.5 mm (approximately 1/8 inch) stereo jack plug often color-coded lime green (following the PC 99 standard) for computer sound cards. A plug and socket for a two-wire (signal and ground) coaxial cable is widely used to connect analog audio and video components. Rows of RCA sockets are found on the backs of stereo amplifier and numerous A/V products. The prong is 1/8" thick by 5/16" long. A few use an RCA connector for input. There are also USB speakers which are powered from the 5 volts at 500 milliamps provided by the USB port, allowing about 2.5 watts of output power.

### **Plotter**

The plotter is a computer printer for printing vector graphics. In the past, plotters were used in applications such as computer-aided design, though they have generally been replaced with wide-format conventional printers. It is now commonplace to refer to such wide-format printers as "plotters," even though they technically are not.

## Unit 2

# Using the Computer and Managing Files

The most popular computer operating system, particularly for PCs is Microsoft Windows.

An operating system is executive software that provides the bridge between applications software and the hardware. It facilitates communication between the user and the computer and automatic loading of programs into RAM in order to provide a continuous flow of operations

- Initial set-up of the computer, when it is switched on
- Communication between the user and hardware
- Calling up of files from storage into memory
- File management

The most popular computer operating systems are Microsoft Windows, Linux and UNIX.

Microsoft Windows includes the following features.

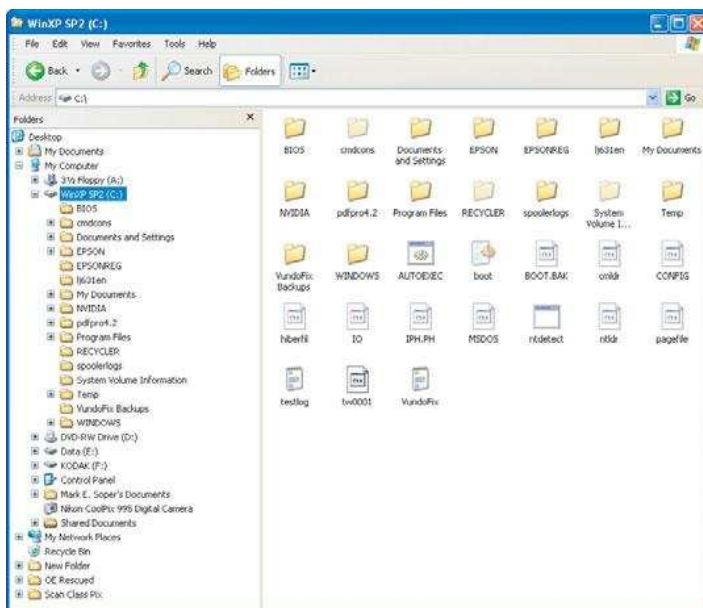
- a) A **desktop** from which everything in the system branches out. Disk drives, folders (directories), applications and files can all be placed on the desktop.
- b) A **taskbar** which includes a **start** button and buttons representing every open application.
- c) Long file names are supported (up to 256 characters).
- d) There is a **Recycle Bin** for easy deletion and recovery of files.
- e) Easy integration with widely used **networking** software is possible.
- f) **Multitasking** is available, allowing more than one program to be active at one time.
- g) The Microsoft Internet Explorer browser is included to facilitate Internet access.
- h) **User-friendly**, user interface enhancements include easier navigation, such as single-click launching of applications, icon highlighting, forward buttons, and an easy to customize Start Menu.
- i) **Web integration**, there are a variety of features designed to enhance Internet access and use of Internet facilities and technologies and integrate them with the users system.
- j) **Reliability**
  - Windows can be set up to regularly test the user's hard disk, system files, and configuration information to increase the system reliability, and in many cases fix problems automatically.
  - Enhanced backup and restore functions
- k) **Graphics**. Windows has graphics and video capabilities and support for games hardware such as joysticks; it supports digital video disks (DVD).
- l) More manageable for businesses, tools such as Dr. Watson and System Information utility make it easier for IT support staff to diagnose and correct problems.
  - a) Windows has graphics and video capabilities and support for games hardware such as joysticks. It supports digital video disks (DVD)

## User Interface characteristics

- i) **GUI**, this stands for Graphical User Interface. GUIs were designed to make computers more user-friendly. A GUI involves the use of two design ideas and two operating methods which can be remembered by the abbreviations WIMP (Windows, Icons, Mouse and Pull-down menu. Most dialogue between the user and software that uses WIMP features is conducted through the mouse and onscreen images rather than typed text.
- ii) **The desktop**, in Microsoft Windows, the initial screen is called the desktop. The desktop screen typically contains icons that provide easy access to a range of software programs. Programs may be started from the desktop using either an icon or shortcut or by navigating through the menus that branch out from the START button. Each active program or activity is launched in a separate window.
- iii) **Task bar**, as with many Microsoft Windows operations, there is more than one way to switch between open applications. The popular method of switching between applications is to simply click on the icon of the relevant open application displayed on the Windows Taskbar. The Taskbar usually shows at the bottom of the screen, although some systems are set-up to 'hide' the Taskbar.
- iv) **Title bar**, it's shown in a strip at the top of the window. It comprises the default menu items which when selected pulls down another menu that pertains to that particular choice. The main menu items are File, Edit, View, Insert etc. This is sometimes called a title.
- v) **Recycle bin**, this is a folder or directory that keeps all files that are deleted from the hard disk or fixed disk. Logically the files are deemed to have been deleted but physically they are usually still on the disk. When the user selects an option called empty the recycle bin that's when the bin is emptied and the files are no longer accessible

## Directory or folder

This is a sub division of a disk. Users can create a folder or a directory so that files that pertain to a common subject are stored in there for easy reference or location. Folders such as My Pictures, My Documents etc. are typical examples



**Figure 12.** Windows Explorer showing a directive folders.

## Unit 3

# Word Processing

A word processor (more formally known as document preparation system) is a computer application used for the production (including composition, editing, formatting, and possibly printing) of any sort of printable material. Word processing packages are suites of programs which users use to produce typed documents using computers

### Examples of word processors are;-

- i) Microsoft Word
- ii) Open Office writer
- iii) WordStar
- iv) Easy Writer
- v) Word Perfect
- vi) Works Word

### Features of Word processing packages

#### 1. *Spell-checker*

This is a feature that allows users of a word processing program to automatically check for spelling mistakes.

#### 2. *Thesaurus*

This is a feature that allows users of a word processing program to replace those words that have been overused in document with words of similar meaning.

#### 3. *Fonts*

A font is a set of printable or displayable text characters in a specific style and size. The type design for a set of fonts is the typeface and variations of this design form the *typeface family* . Thus, Helvetica is a typeface family, Helvetica italic is a typeface, and Helvetica italic 10-point is a font. In practice, *font* and *typeface* are often used without much precision, sometimes interchangeably. Some of Microsoft Word fonts include Times New Romans, Arial, Agency FB, Aharoni etc.

#### 4. *Grammar Checker*

A grammar checker feature, in computing terms, is a program, or part of a program, that attempts to verify written text for grammatical correctness. Grammar checkers are most often implemented as a feature of a larger program, such as a word processor, but are also available as stand-alone application that can be activated from within programs that work with editable text.

#### 5. *Save*

This is a feature that allows users of a word processing program to store the typed document for future use.

#### 6. *Print*

This is a feature that allows users of a word processing program to produce hard copies of a typed document.

## **7. Print Preview**

This is a feature that allows users of a word processing program to view the typed document on the screen before sending it to the printer.

## **8. Mail merge**

This is a feature that allows users of a word processing program to merge a typed document to a database so as to produce personalized documents.

## **9. Copy & Paste**

This feature allows users of a word processing program to copy a word, paragraph or a section of a document from one area to another.

## **10. Cut & Paste**

The term "*cut and paste*" comes from the traditional practice in manuscript-editing. This is where people would literally cut paragraphs from a page with scissors and physically paste them onto another page. In computers terms this is where a word processing program cut (transfers) a word, paragraph or a section of a document from one area to another.

## **11. Page Numbering**

Page numbering is the process of applying a sequence of numbers (although, sometimes the pages are identified not by numbers but by other symbols, like letters : a, b, c, ..., z, aa, ab, ac, ..., zz) to the pages of a book or other document. Word processors allow users to add page numbers to their documents.

### **Advantages of Word Processing Programs**

- i) The ability to check for and correct spelling mistakes in the document.
- ii) The ability of allowing users to replace words that have been overused in a document with words of similar meaning.
- iii) The ability to allow users of word processing program to use different typefaces in a document.
- iv) The ability to allow users of a word processing program to store the typed document for future use.
- v) The ability to allow users of the word processing program to automatically check for grammar mistakes in a document.
- vi) The ability to enable users of a word processing program to print (produce hard copies of a typed document).
- vii) The ability to enable users of a word processing program to preview (view the typed document on the screen before sending it to the printer).
- viii) The ability to allow users of a word processing program to merge a typed document to databases so as to produce personalized documents.
- ix) The ability to enable users of a word processing program to copy a word, paragraph or a section of a document from one area to another.

- x) The ability to enable users of a word processing program to automatically insert page numbers in a document.

Activity 3 (4 Hours practical on computers and 1 hour writing (or discussion) on category 6 below)

Get on a computer that has Microsoft Office Word 2007. Open Microsoft Word 2007.

1. Navigate the Microsoft Office Word 2007 interface. Identify the following:-
  - Microsoft Office Button
  - The Quick Access Toolbar
  - The Title Bar
  - The Ribbon
  - The Ruler
  - The Text Area
  - The Vertical and Horizontal and Vertical Scroll Bars
  - The Status Bar
2. Microsoft Word 2007 Basic Features
  - Type, Backspace, and Delete
  - Bold, Italicize, and Underline
  - Save a File and Close Word
3. More Basic Features
  - Open a File
  - Cut and Paste
  - Copy and Paste
  - Use the Clipboard
  - Use Spell Check
  - Find and Replace
4. Formatting Paragraphs and Working with Styles
  - Open a Blank Document and Add Sample Text
  - Add Space Before or After Paragraphs
  - Change Line Spacing
  - Create a First-Line Indent and Indent Paragraphs
  - Align Paragraphs
  - Create a Hanging Indent
  - Choose a Style Set
  - Apply a Style and Change Style Sets
  - Change the Font Size
  - Change the Font
  - Save Your File
5. Adding Bullets and Numbers, Undoing and Redoing, Setting Page Layouts and Printing Documents
  - Add Bullets and Numbers
  - Undo and Redo
  - Set the Orientation
  - Set the Page Size
  - Set the Margins
  - Add Page Numbers
  - Insert Page Breaks
  - Preview and Print Documents
6. You are very much aware that some time back the means for producing a typed document was through the use of a typewriter which has now seen itself in the archive. Most organizations and individuals are now using computers and word processing programs. Outline FIVE reasons why organizations are now using word processing programs in preference to the typewriter in the production of a typed document.

## Unit 4

# Spreadsheets

A **spreadsheet** is an interactive computer application program for organization and analysis of information in tabular form. Spreadsheets developed as computerized simulations of paper accounting worksheets. The program operates on data represented as cells of an array, organized in rows and columns. Each cell of the array can contain either numeric or text data, or the results of formulas that automatically calculate and display a value based on the contents of other cells.

Spreadsheets are popular examples of generalized software packages. They are used for general purposes. They are tools which can be used for tasks which arise in a variety of different applications involving calculations as rows and columns as numbers. A spreadsheet is divided into rows and columns. Rows are identified by numeric numbers and columns are identified by the alphabetic characters.

### Examples of Spreadsheets are:-

- i) Microsoft Excel
- ii) Google Spreadsheets
- iii) VisiCalc (Very Old - first ever electronic spreadsheet?)
- iv) Apple Works
- v) Open Office
- vi) Lotus 1-2-3

### Where Spreadsheets are used:-

- i) Analyzing statistics
- ii) Creating business plans
- iii) Creating business budgets
- iv) Estimating business costs
- v) Calculating profits or losses
- vi) Sales forecasting
- vii) Financial analysis

### Features of Spreadsheets:-

- i) **Charts**  
This feature allows the user to show the data in the worksheet in graph form.
- ii) **Formula**  
This feature allows the user to build in formula in a workbook.
- iii) **Formula auditing**  
Formula auditing is a feature that allows the user to check the correctness of the built formulas.
- iv) **Error checking**  
This feature allows the user to check the correctness of the errors in the worksheet.

- v) **Sort**  
A feature that enables the user to rearrange the worksheet in predetermined order.
- vi) **Mathematics**  
A feature that enables the user to do mathematical operations on data.
- vii) **Save**  
This is a feature that allows the user to store worksheets for future use.
- viii) **Cells**  
A feature that allows users to store entries in different cells.

### Advantages of Spreadsheet programs

- i) Ability to build in formula in a worksheet.
- ii) Ability to store a worksheet for future use.
- iii) Ability to incorporate mathematics.
- iv) Ability to audit the formulas
- v) Ability to hide each entry from another cell.
- vi) Ability to rearrange a worksheet in predetermined order.
- vii) Ability to check for errors in a worksheet.

### Activity 3 (4 Hours practical on computers)

Get on a computer that has Microsoft Office Excel 2007. Open Microsoft Word 2007.

#### 1. Entering Text and Numbers

- The Microsoft Office Button
- The Quick Access Toolbar
- The Title Bar
- The Ribbon
- Worksheets
- The Formula Bar
- The Status Bar
- Move Around a Worksheet
- Save a File

#### 2. Entering Excel Formulas and Formatting Data

- Perform Mathematical Calculations
- Align Cell Entries
- Perform Advanced Mathematical Calculations
- Copy, Cut, Paste, and Cell Addressing
- Insert and Delete Columns and Rows
- Merge and Center
- Add Background Color
- Change the Font, Font Size, and Font Color
- Bold, Italicize, and Underline
- Change A Column's Width and Height
- Format Numbers

#### 3. Creating Excel Functions, Filling Cells, and Printing

- Using Reference Operators
- Understanding Functions
- Calculate an Average
- Fill Cells Automatically
- Set Print Options
- Print
- Creating Charts



# Unit 5

## Database

### What is a Database Management System?

A **database management system (DBMS)** is a software package with computer programs that controls the creation, maintenance, and use of a database. It allows organizations to conveniently develop databases for various applications. A database is an integrated collection of data records, files, and other objects. A DBMS allows different user application programs to concurrently access the same database. The role of the DBMS is to facilitate the creation, maintenance, access, backup and security of the database.

### *Functions of a Database Management System*

#### *Data definition*

The Database Management System must be able to accept data definitions from the source in source format and convert them to the suitable and appropriate object form. It should associate data mappings and interpret the format of the different data definition languages used in data development.

#### *Data manipulation*

The Database Management System handles all the requests issued by a user to the database such as retrieve, update, add or delete the data stored data in the database. It is the one that makes changes in form of updates or data addition to the database.

#### *Optimization and execution*

The Database Management System has to handle the queries in time. This means that all the issued queries are executed under the control of a run time manager which insures that data is presented to a user on time. All commands issued by the user are executed by the Database Management System and present the requested data to the user.

#### *Data security and integrity*

The Database Management System checks the access control list and executes the requested commands according to the privileges of the user. This prevents illegal damage to the data in the database. This insures that the data in the database is intact (data integrity).

#### *Data recovery and concurrency*

The Database Management System also enforces data recovery and concurrency controls. This means that once data is stored in the database it remains intact and current just as it was stored. The Database Management System keeps track of all the data in form of backups to easily recover any data damage or loss.

#### *Data dictionary*

The Database Management System provides a data dictionary. This data dictionary has a full knowledge and understanding of all the stored data in the database. It also knows the privileges users have who access the database and interpret them accordingly. For this reason we can say the Database Management System depends on the data dictionary for data definitions.

### Performance

The Database Management System is the one responsible of performing all of the tasks user issue to the stored database efficiently. All the glory the companies enjoy about databases are as a result of the performance and efficiency of the Database Management System.

### Advantages of a Database Management System

Databases have brought a lot of advantages in many organizations. These include compactness of data reducing large volumes of data to be used, Speed in doing work, less drudgery, currency of data worked on, and protection. There are so many benefits of using databases. These include;-

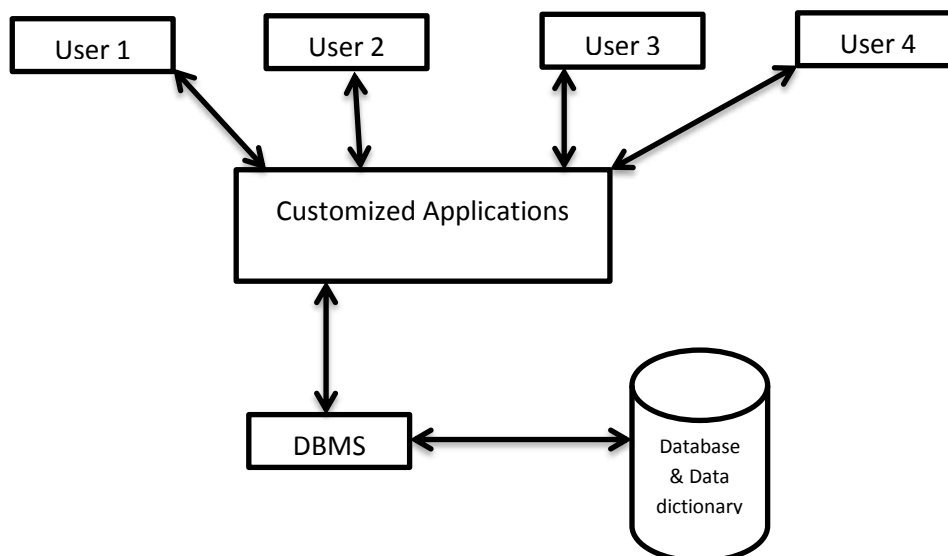
1. The data is shared.
2. Data redundancy is reduced.
3. Data inconsistency is avoided to some extent.
4. Transaction support can be provided.
5. Integrity can be maintained.
6. Security can be enforced.
7. Conflicting requirements can be balanced.
8. Standards can be enforced

### Disadvantages of a Database Management System

1. Database systems are complex, difficult, and time-consuming to design
2. Substantial hardware and software start-up costs
3. Damage to database affects virtually all applications programs
4. Extensive conversion costs in moving from a file-based system to a database system
5. Initial training required for all programmers and users

### Database

A database is a single organized collection of structured data, stored with a minimum of duplication of data items so as to provide a consistent and controlled pool of data. This data is common to all users of the system, but is independent of programs that use the data.



**Figure** An outline view of a database system

## Examples of Database Management Software are;-

1. Microsoft Access,
2. MySQL,
3. Microsoft SQL Server,
4. Oracle and
5. FileMaker Pro

### Modeling language

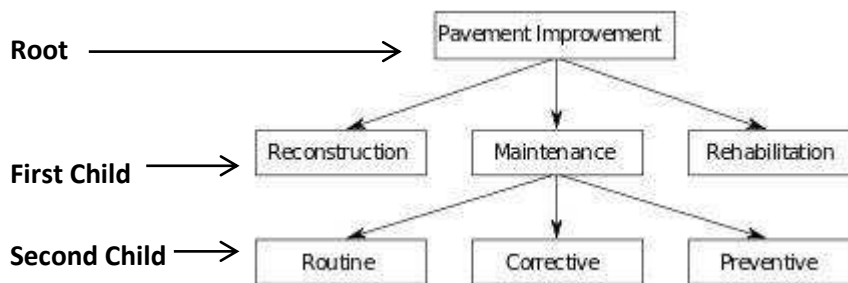
A modeling language is a data modeling language to define the schema of each database hosted in the DBMS, according to the DBMS database model. Database management systems (DBMS) are designed to use one of five database structures to provide simplistic access to information stored in databases. The five types or structures of databases are:

- Hierarchical model,
- Network model,
- Relational model,
- Multidimensional model, and
- Object model.

Let us look at three common database models that have been used widely.

### Hierarchical Model

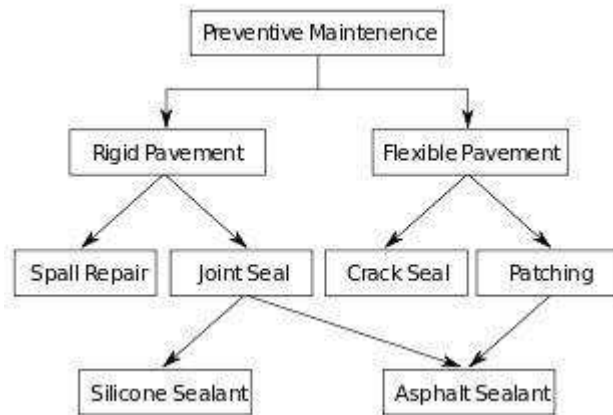
A hierarchical database model is a data model in which the data is organized into a tree-like structure. The structure allows representing information using parent/child relationships: each parent can have many children, but each child has only one parent (also known as a one-to-many relationship). All attributes of a specific record are listed under an entity type. A parent is a main container which may have one or many child containers. The hierarchical data model is like a tree. The tree has a stem which contains branches and each branch may contain other branches and leaves. This kind of database as you can see has well-defined relationship between parent and child but not with other database entities. The Hierarchical databases are very useful when creating databases that map one entity to many entities. It is one of the first database models used but it is not widely used like the relational model. When you want to access certain data in the hierarchical database model, you will have to figure out the branch to start with and the route to take until the required data is reached. It does not create links to other entities in the database. Once you miss a branch with the date entity you are searching, you will not find it anywhere else unless you get back and use the right path. It does not create relationships with other branches. The table below shows the hierarchical database model.



**Figure** The Hierarchical Model

## Network Model

The **network database model** follows the structure of the hierarchical database model. Unlike the hierarchical database model which restricts a child to parent link, the network database model allows each data entity to have multiple paths or parent and child links. This makes a network database model a more redundant model as it forms a mesh network-like structure. The network name does not mean that it looks like a network but its entities are related to each other using multiple links. This network model makes data access so quick and redundant as there are so many links to the same location. The database is made up of records which are parents of other records and at the same time the same parents are children of other records. Could be a child record is also a parent record to its parent record. The diagram below shows the network database model.



**Figure** The Network Model

## Relational Model

The relational data model represents all data in the database as simple two-dimensional tables called relations. A **relational database model** of a database uses columns and rows to contain and organize data. This database model is the most widely used model amongst all the other models today. The data or information is presented in table formats. A relational database is composed of two-dimensional tables, and each table contains unique rows, columns, and cells (the intersection of a row and a column). Columns are also called attributes whereas the rows are called tuples. Data is contained in cells which are made up of attributes and tuples. In each cell only one data value can be represented for a specific attribute value within a given tuple or row. These data entities have relationships which make them be linked to each other. These relationships in relational databases between the data entities of a database make the framework for which data is organized. Each entity in a database has a name which identifies it from others. This name or identity is known as a primary key. A primary key is a field that links all the data within a record to a unique value. For example, in the table below the primary keys are 1001, 1002, 1003 and 1004. If someone refers to 1001 the primary key they will be actually referring to all the other data in a row about Kabungo Sharlene which will show her sex and course taken.

**Columns (Attributes/Field)**

Student Number	Surname	Forenames	Sex	Course
1001	Kabungo	Sharlene	Female	ITM 2150
1002	Sakulala	Mulombwe	Female	ITM 2150
1003	Miyoba	David	Male	ITM 2150
1004	Moomba	Adolf	Male	CS 1111

**Table** Relational Database Model

Activity 3 (5 Hours practical on computers)

Get on a computer that has Microsoft Office Excel 2007. Open Microsoft Office Excel 2007.

1. Getting Familiar with Microsoft Access 2007 for Windows
2. Creating Microsoft Access Tables
3. Working with Microsoft Access Tables
4. Sorting, Filtering, and Creating Relationships
5. Creating Microsoft Access Queries
6. Creating Forms
7. Creating Reports
8. Print a Report

## Unit 6

# Presentation

A **presentation program** (also called a **presentation graphics** program) is a computer software package used to display information, normally in the form of a slide show. It typically includes three major functions: an editor that allows text to be inserted and formatted, a method for inserting and manipulating graphic images and a slide-show system to display the content.

### Features of Presentation Programs

1. Insert Slide Feature: Allows you to inset slide anywhere in the presentation, at the beginning, middle or end.
2. Deletion of Inserted slides: Any slide of the presentation can be removed.
3. Allows cut and paste slides in any order.
4. Allows duplication content or slide
5. Allows you to display the presentation designed in a slide show system. (View Slide Feature)
6. Allows animations and/or sounds manipulations on objects in the slide.
7. Simple Find and Replace, and text editor features.
8. Good font specifications - Allows you to change and use different font faces, styles, and effects
9. Additional features for slide: footnotes, cross references, advanced navigation system, headers, footers
10. Good layout management system: Presets or Customized layout designing
11. Macros - for add interactive features
12. Spell checkers and dictionary support

### Advantages of Presentation Programs

1. Can easily input images
2. Templates are built in for different appearances
3. Can add notes pages
4. Can easily add media and recordings
5. More exciting than a simple word document or hand written presentation
6. Master slides make presentations consistent

### Disadvantages of Presentation Programs

1. Some features such as animations and backgrounds can distract the audience from the actual information in the presentation
2. File size can become quite large on medium to large presentations
3. Some of the features can be quite complicated to use and even the simple features require some getting used to
4. When at work, you can't rely on someone else's computer or laptop to run your presentation, there are too many software conflicts and disk space barriers.
5. Takes quite a bit of time to create a complete presentation

### Examples of Presentation Software are;-

1. Microsoft Office PowerPoint.
2. Adobe Persuasion
3. Apple Keynote
4. Google Docs
5. IBM Lotus Freelance Graphics
6. Kingsoft Presentation
7. KPresenter

#### Activity 3 (4 Hours practical on computers)

Get on a computer that has Microsoft Office PowerPoint 2007. Open Microsoft Office PowerPoint 2007.

1. The PowerPoint Window
  - The Microsoft Office Button
  - The Quick Access Toolbar
  - The Title Bar
  - The Ribbon
  - Rulers
  - Slides, Placeholders, and Notes
  - Status Bar, Tabs, View Buttons, and More
2. Creating Your First PowerPoint Presentation
  - Create a Title Slide
  - Create New Slides
  - Make Changes to Your Slides
  - Apply a Theme
  - Run Your PowerPoint Slide Show
3. Animations, Transitions, Spell Check, Outline Tab, Slides Tab, Sorter View, and Printing
  - Add Animations
  - Add Transitions
  - Spell Check
  - Use the Outline and Slides Tabs
  - Use Slide Sorter View
  - Print

## Unit 7

# Communication & Internet

### Using the Internet & E-mail facilities

The Internet is the name given to the technology that allows any autonomous computers within a building or outside the country with a telecommunications link to send, receive and access information from any other suitably equipped computer via Internet Service Providers.

Internet Service Providers, these are organizations that allow several autonomous computers to be connected to them as part of the Internet, for example in Zambia there is Zamtel, Zamnet, Coppernet and Microlink. Clients have to initially pay for the connection fees and then monthly charges based on 40 hours per week access and an extra charge for hours above 40 hours.

### ISPs provide the following services:

- Connecting users to the International network
- Developing websites on behalf of clients
- Web hosting that is storing information on behalf of clients for other Internet users to access.
- Allows clients to have e-mail addresses on the ISPs machine

An extranet is an intranet that is accessible to authorized outsiders, using a valid username and password. Private intranets that are extended to users outside the company are called extranets. For example, authorized buyers could link to a portion of a company's intranet from the public Internet to obtain information about the cost and features of its products. The company can use firewalls to ensure that access to its internal data is limited, and remains secure; and to authenticate users, making sure that only those who are authorized to access the site can be identified.

Extranets are especially useful for linking organizations with customers or business partners. They are often used for providing product-availability, pricing and shipment data and electronic data interchange (EDI), or for collaborating with other companies on joint development or training efforts.

An Intranet is like a mini version of the Internet. Organization members use networked computers to access information held on a server. The user interface is a browser that is similar to those used on the Internet. The intranet offers access to information on a wide variety of topics, and often includes access to the Internet.

- i) Users access the Internet through interface programs called browsers. The most popular and best known is Microsoft Internet Explorer, Firefox, Safari, Opera and Netscape Navigator etc. Browser software packages provide facility to store Internet addresses so that users can access frequently-visited sites without having to go through long search process. Thus in business use, workers who regularly need up-to-date information, say, on stock market movements, or new government legislation, or the activities of a competitor, can simply click on the appropriate entry in a personal 'favorites directory and be taken straight to the relevant site. Searching the net is done using a search engine. Popular search engines include Google, Alta Vista, Lycos, AskJeeves, WebCrawler, Yahoo! and AllTheWeb. These guide users to destinations throughout the web: the user simply types in a word or phrase.
- ii) The problems that are brought about by the introduction of the Internet in an accounting department are:
  - Since the Internet has too much information it leaves much to be desired because the quality of the information the accounts people will be producing will be compromised.



- Speed is a major issue. Data only downloads onto the user's PC at the speed of the slowest telecommunications link – downloading data can be a painful slow procedure especially if there are deadlines to be met.
- The Internet has so much information and entertainment available such that employers worry that their staff will spend too much time browsing through non-work related sites, this does happen and it affects the company's productivity.
- Connecting an information system to the Internet exposes the system to numerous security issues such as hackers, eaves droppers and spam mail.
- Pornographic materials can be accessed by accounting staff, by so doing cases of sexual harassments at work places may increase.
- Job searches, since some organizations advertise on the Internet, employees will spend and waste a lot of valuable company time searching for better jobs on the net.
- The organization accounting information is vulnerable to Internet viruses during downloads of attachments from emails.
- Spy ware, when accounting staff visit unauthorized sites, the site visited will store the computers address, and then send a program to the server so that it can copy important information which will be sent back to that site that was earlier visited. This program is called spy ware.

iii) Computer users may know the precise address of an Internet site that is to be visited, perhaps because you have seen or heard it on TV or radio or read it in a newspaper or magazine. Typically the format is something like

**'http://www.bbc.co.uk'**

The address is called a **URL** or **Uniform Resource Locator** as Uniform Resource Location.

### **Internet Technologies**

**Video conferencing**, this is the use of computer and communications technology to conduct meetings. Video conferencing has become increasingly common as the Internet and webcams have brought the service to desktop PCs at reasonable cost.

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