



**FACULTY OF MARINE SCIENCES  
CAS IN MARINE BIOLOGY (2019-20)  
BFSC (I Year) - SECOND SEMESTER**

**BFSC-209 INFORMATION AND COMMUNICATION TECHNOLOGY  
(UNIT NOTES FOR REFERENCE)**

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## **BFSC-209 Information and Communication Technology**

### **Unit – I**

#### **Introduction to IT**

Information technology (IT) is a technology which uses computers to gather, process, store, protect, and transfer information. Today, it is common to use the term Information and communications technology (ICT) because it is unimaginable to work on a computer. ICT can be used to access, process, manage and present information; model and control events; construct new understanding; and communicate with others.

#### **Importance of IT**

In recent years, as ICTs have become a more important part of the global information economy, more attention has been given to the gap in access to ICTs between developed and developing nations, and also within countries. In recent years, as ICTs have become a more important part of the global information economy, more attention has been given to the gap in access to ICTs between developed and developing nations, and also within countries.

#### **IT TOOLS**

ICTs are basically information-handling tools—a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the ‘old’ ICT of **radio, television and telephone** and the ‘new’ ICT of **computers, satellite and wireless technology and the Internet**. With appropriate content and applications, these tools are now able to work together, and combine to form a ‘networked world’—a massive infrastructure of interconnected telephone services, standardized computing hardware the Internet, radio and television—which reaches into every corner of the globe.

## **IT enabled services**

Information and Communication Technology (ITC) exists in every aspect of modern society. Some well known applications include:

ICT are used everywhere. Some of the areas of ICT applications are given below.

1. **Accounting:** Computers are used to maintain accounts efficiently. Computers do inventory management, financial management and cash management very easily. In computerized accounting we can easily take the reports like trail balance, profit and loss account and balance sheet.
2. **Banking :** Now a days all banks are computerized. Customer transactions are maintained by computers. Computer controlled Automatic Teller Machines (ATM) are used for cash withdrawals.
3. **Medical :** In hospitals, Computers are used to maintain patient details, their diseases and treatments given by the doctors. Also in hospitals, most of the equipments are computer controlled. The doctors use these equipments for effective diagnosis.
4. **Education:** Computers can be used in education to teach students. Students can get most of the details using various websites available in the Internet.
5. **Designing :** In textile business, It is used to draw a new designs. By using AutoCAD software, Engineers draw the blue prints of their proposed buildings.
6. **Transport :** In railways, it used for reservation and cancellation of tickets in easy manner. Airways and Shipping Corporation use computers in their day-to-day activities.
7. **Communication:** E-mail, voice mail and Video conferencing are possible by using computers. Computers control telephone and mobile phone communication also.
8. **Engineering :** Computer-aided manufacturing (CAM) software is used by the engineers to design new products before their manufacture.

9. **Entertainment** : Computers are used to play movies and to play games
10. **Publishing** : Publishers use computer to prepare and format the content of the book.
11. **Space Technology**. Computers control space research stations.
12. **Insurance**: Insurance companies use computer to maintain their policy holder's details.
13. **Cinema** : Computers are used for adding graphical effects in films.
14. **Defense** : Computer is used to control missiles efficiently.
15. **Libraries** : In library, Computers are used to maintain information about books. Book issues and receipts are fully controlled by the computers. Computers are used to calculate the penalty for overdue books automatically.

### **Impact of Information Technology on Societal Development**

A society can also refer specifically to any group of people and the interactions within that group. This can be anything from a small neighborhood to the entire global community. Religion, ethnicity, interests, political opinions or other relating factors may help form a group of people

We shall use the common traditions, institutions and collective activities and interests as the basis for our examination of the impact information technology has had on society. We shall also integrate this examination with the impact of how information technology has changed the "way we work". This integration will occur in two areas of the analysis of society, first the institutions and second the collective activities of the society.

### **Computer fundamentals**

Computer as a revolution left no area of life untouched in the present world. It is of tremendous help in all field of life. Hence, the knowledge of computer is a necessity for existence of everybody in this global village. The invention of computer has transformed our simple manual works to

sophisticated life of automated works to meet the global demand for the higher productivity and increased efficiency with high precision.

A computer is an electronic device, operating under the control of instructions stored in its own memory. These instructions tell the machine what to do. The computer is capable of accepting data (input), processing data arithmetically and logically, producing output from the processing, and storing the results for future use. Most computers that sit on a desktop are called Personal Computers (PCs).

The "computer" is an ensemble of different machines that you will be using to get your job done. A computer is primarily made of the Central Processing Unit (usually referred to as the computer), the monitor, the keyboard, and the mouse. Other pieces of hardware are commonly referred to as peripherals.

## **CHARACTERISTICS OF COMPUTERS**

The characteristics of computers, which made them so powerful and useful, are

1. SPEED
2. ACCURACY
3. CONSISTENCY
4. STORAGE
5. VERSATILITY
6. AUTOMATION

### **SPEED**

Computers are able to do all tasks at amazing speeds. Although the speed of the computer will depend on how powerful the computer is, it can still process a lot of data at high speed. The computers speed is measured in terms

of Millions of Instructions per second also called MIPS. For the personal computer, speed depends on the clock frequency expressed in MHz per second.

### **ACCURACY**

The computer does not make mistakes. Once the right instructions have been given to it, the chances of computer making errors are almost zero. If faulty instructions are provided for processing the data, obviously faulty answers will be given. This is called GIGO ie., Garbage In Garbage Out.

### **CONSISTENCY**

After doing work for some time humans become tired. But computers do not become tired. This leads to it giving a consistently good performance hour after hour. This is also called diligence.

### **STORAGE**

Computers come with large amount of memory. They can hold lot of data. computers can retrieve a particular piece of information from large amount of data in a short time. This is called retrieval of data. Storage of data and information on the computer allows reduction of paper filing and other mundane tasks. Storage is expressed in terms of Bytes like

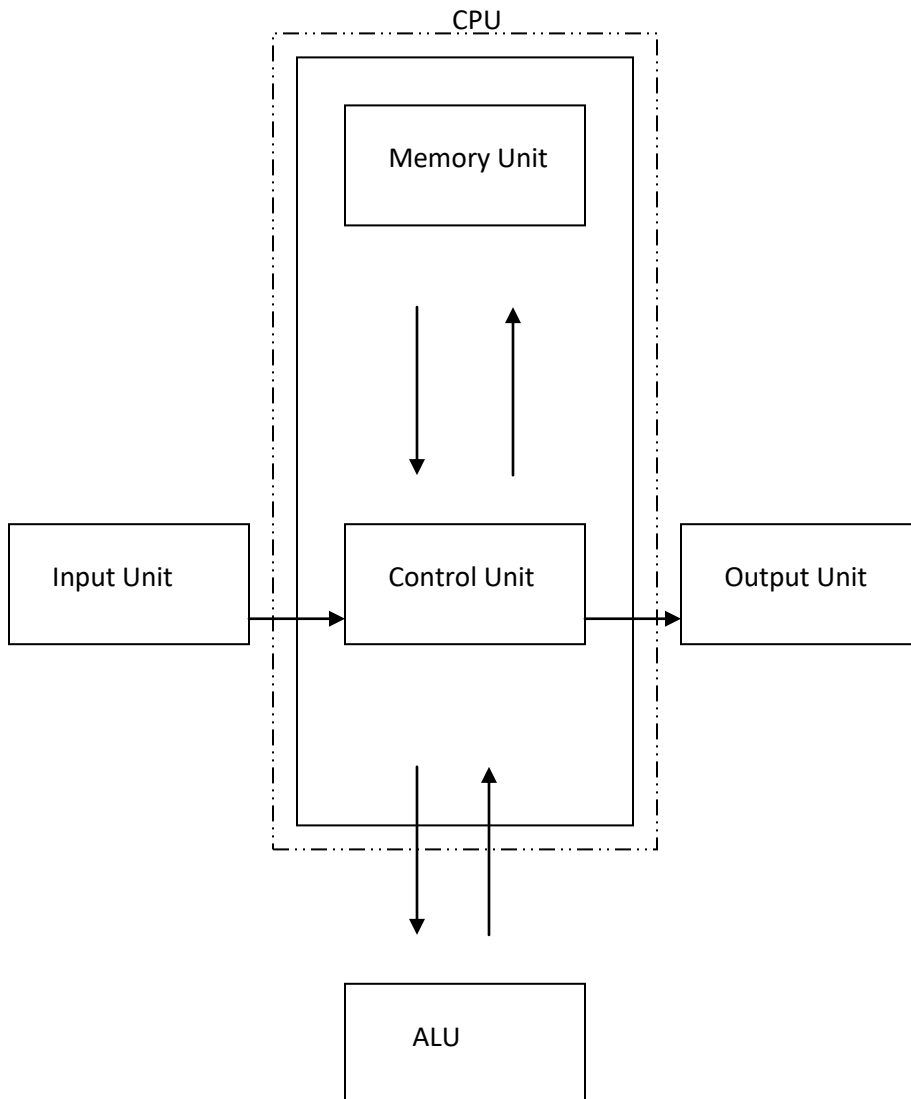
### **VERSATILITY**

Computers are capable of solving various types of problems. It is used both in simple activities such as preparing payroll and in complex activities such as controlling the aircraft.

### **AUTOMATION**

Computers have made automation of many complicated processes possible not only complicated processes but also some dangerous processes that pose health risks to human beings have been computerized.

## TYPICAL COMPUTER SYSTEM



### **A TYPICAL COMPUTER SYSTEM**

The box kept beside the monitor houses some of the most important and delicate parts of the computer. The part of the computer that does all the work all the thinking or all the processing is called the central processing unit or CPU.



CPU consists of three parts, which are inside name.

1. ALU
2. Control Unit
3. Memory Unit

## **ALU**

The ALU takes care of all the mathematical and logical or comparison functions done by the computer. Eg:- Addition, Subtraction, Multiplication, Division, Greater than, Less than etc.

## **Control Unit (CU)**

The control unit controls the entire operations of all the units of a computer. It brings one instruction at a time from the memory, interprets it and obeys it by coordinating the working of all the other units. In other words, this unit is considered to be the nervous system of a computer. All the commands are regulated and controlled by this unit.

## **MEMORY UNIT**

This unit consists of locations or cells on which the data can be stored. If you want to retrieve the data, the data can be retrieved from the same unit. This unit consists of two types of memories, Permanent memory and secondary or auxiliary memory.

## **INPUT UNIT**

Input unit is used to receive data and instruction in a form that can be understood by the computers. I/p unit is that a part of a computer to which the data and instruction is feed. Its function is to read the information and transmit to the CPU.

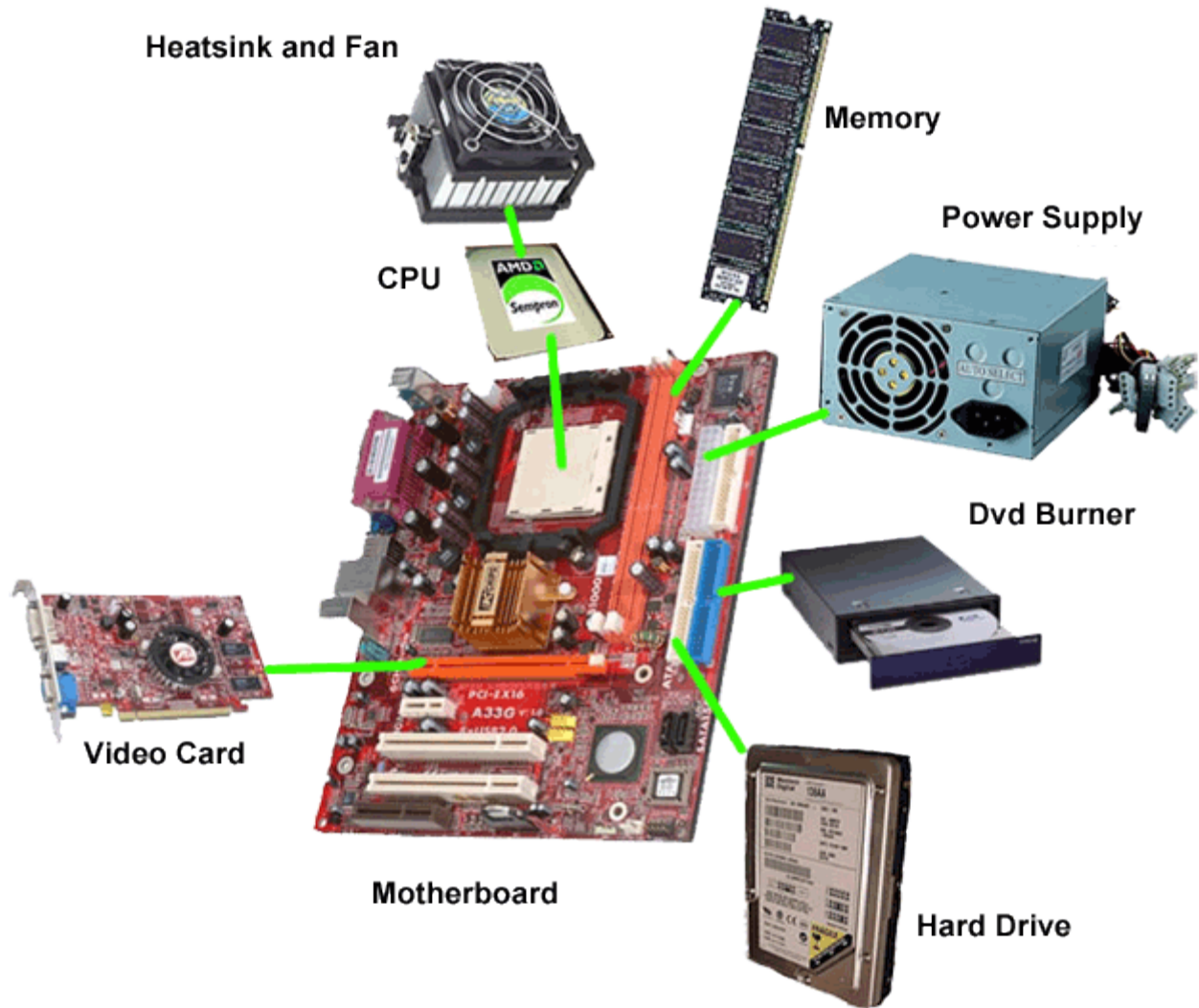
## **OUTPUT UNIT**

On completion of the process the data are stored in the memory and control unit transfers the data in the memory unit to the o/p unit and it convert the information into the form of human readable languages.

### **The Computer Internals**

The computer is a component of many small parts which works each other in smooth co-ordination. These are important parts :-

1. Motherboard.
2. CPU/Processor
3. Memory (RAM)
4. Hard disk drive
5. Optical disk drive
6. Power supply unit
7. Expansion Cards
8. Computer clock



**1. Motherboard**

The **motherboard** is the computer's **main circuit board**. It's a thin plate that holds the CPU, memory, connectors for the hard drive and optical drives, expansion cards to control the video and audio, and connections to your computer's ports (such as USB,PRINTER ports). The motherboard connects directly or indirectly to every part of the computer

**2. CPU/Processor**

The central processing unit (CPU), also called a **processor**, is located inside the **computer case** on the motherboard. It is sometimes called the brain of the computer, and its job is to carry out commands. Whenever you press a key, click the mouse, or start an application, you're sending instructions to the CPU.

The CPU is usually a **two-inch ceramic square** with a **silicon chip** located inside. The chip is usually about the size of a thumbnail. The CPU fits into the motherboard's **CPU socket**, which is covered by the **heat sink**, an object that absorbs heat from the CPU.

A processor's **speed** is measured in **megahertz (MHz)**, or millions of instructions per second; and **gigahertz (GHz)**, or billions of instructions per second. A faster processor can execute instructions more quickly. However, the actual speed of the computer depends on the speed of many different components—not just the processor.

### **3. RAM (random access memory)**

RAM is your system's **short-term memory**. Whenever your computer performs calculations, it temporarily stores the data in the RAM until it is needed.

This **short-term memory disappears** when the computer is turned off. If you're working on a document, spreadsheet, or other type of file, you'll need to **save** it to avoid losing it. When you save a file, the data is written to the **hard drive**, which acts as **long-term storage**.

RAM is measured in **megabytes (MB) or gigabytes (GB)**. The **more RAM** you have, the more things your computer can do at the same time. If you don't have enough RAM, you may notice that your computer is sluggish when you have several programs open. Because of this, many people add **extra RAM** to their computers to improve performance.

#### 4. Hard Disk Drive

The **hard drive** is where your software, documents, and other files are stored. The hard drive is **long-term storage**, which means the data is still saved even if you turn the computer off or unplug it.

When you run a program or open a file, the computer copies some of the data from the **hard drive** onto the **RAM**. When you **save** a file, the data is copied back to the **hard drive**. The faster the hard drive, the faster your computer can **start up** and **load programs**.

#### 5. Optical Disk Drive

An optical drive uses light to read and write data. It is the drive you use to burn CDs, DVDs and Blu-Ray discs. Optical drives can be either slot loading, or tray loading and come in many different configurations. Optical drives connect directly to the motherboard of the computer.

#### 6. Power supply unit (SMPS)

The power supply unit in a computer **converts the power** from the wall outlet to the type of power needed by the computer. It sends power through cables to the motherboard and other components.

If you decide to open the computer case and take a look, make sure to **unplug** the computer first. Before touching the inside of the computer, you should touch a grounded metal object—or a metal part of the computer casing—to discharge any static buildup. Static electricity can be transmitted through the computer circuits, which can seriously damage your machine.

#### 7. Expansion cards

Most computers have **expansion slots** on the motherboard that allow you to add various types of **expansion cards**. These are sometimes called **PCI (peripheral component interconnect) cards**. You may never

need to add any PCI cards because most motherboards have built-in video, sound, network, and other capabilities.

However, if you want to boost the performance of your computer or update the capabilities of an older computer, you can always add one or more cards. Below are some of the most common types of expansion cards.

### **7a. Video card**

The **video card** is responsible for **what you see** on the monitor. Most computers have a **GPU (graphics processing unit)** built into the motherboard instead of having a separate video card. If you like playing graphics-intensive games, you can add a faster video card to one of the **expansion slots** to get better performance.

### **7b. Sound card**

The **sound card**—also called an audio card—is responsible for **what you hear** in the speakers or headphones. Most motherboards have integrated sound, but you can upgrade to a dedicated sound card for higher-quality sound.

### **7c. Network card**

The **network card** allows your computer to communicate over a network and access the Internet. It can either connect with an **Ethernet** cable or through a **wireless** connection (often called **Wi-Fi**). Many motherboards have built-in network connections, and a network card can also be added to an expansion slot.

### **7d. Bluetooth card (or adapter)**

Bluetooth is a technology for wireless communication over short distances. It's often used in computers to communicate with

wireless **keyboards, mice,** and **printers.** It's commonly built into the motherboard or included in a **wireless network card.** For computers that don't have Bluetooth, you can purchase a USB adapter, often called a **dongle.**

## **8. Computer clock**

All computers have a real clock built inside them which is attached to the motherboard. This clock works on a separate battery source. Therefore it remains working even when the computer's power supply is switched off.

## **MEMORY CONCEPTS**

The memory has made the computer the most versatile instrument or machine that man has ever developed. Memory enables the computer to learn and remember different types of functions making it a very efficient machine.

## **MEMORY**

Memory is what allows a person to remember things. "Memory is just a measure of an individual's capacity to remember".

## **COMPUTER MEMORY**

Computer memory is capable to store many programs that allow it to perform tasks. Comparing the computer memory with our own memory, our memory is not a physical entity, where as the case of the computer's memory it does have physical appearance. Data is stored here before the processing takes place and is stored here after it is converted into information. Computer memory is a place that physically holds the data, for the instruction that is going to be processed.

Imagine a large sheet, with vertical and horizontal lines drawn on it the little squares formed by the intersection of the lines are called cells each cell is capable of holding or remembering some piece of data or information.

When some data is entered in the computer every small unit of data is placed in these tiny cells during the process and even after the data that is converted into information remains stored in these tiny cells.

In computers everything is binary. As far as the computer is concerned all data is always numeric information is also numeric, but the computer can convert this into a form that we as users want and give it to us as text, numbers or even pictures. Although the computer is dealing with text, it first gets converted to numbers, gets processed as numbers and then gets displayed again as text this sort of a conversions is done by using a standard coding procedure called ASCII

ASCII stands for American Standard Code for Information Interchange. ASCII is used as standard by the computing world to enable easy exchange of information between different countries or even different types of computer systems.

Computers use only the binary digits namely 0's and 1's. The numbers 0's and 1's denote the state of the circuits being "off" "on" respectively.

Bits-Binary digits-0's and 1's

1 byte-8 bits

1KB (OR) 1KILOBYTE-1024 BYTES

1MB (OR) 1MEGABYTE-1024 KB

1GB (OR) 1 GIGA BYTE-1024 MB

## **TYPES OF COMPUTER MEMORY**

Based on the needs the memory in computers is classified into two types.

1. Primary (or Internal Storage)
2. Secondary (or External Storage)

### **PRIMARY MEMORY**



Primary memory is of the most importance to the immediate processing needs of the computer science this memory is found inside the box where the CPU too is found, it is sometimes also called the internal memory. This is of two types

1. RAM (Random Access Memory)
2. ROM (Read Only Memory)

### **RAM (RANDOM ACCESS MEMORY)**

RAM is essentially a read/write memory. Information can be written into and read from a RAM. It is volatile in nature, i.e. it retains the stored information as long as power supply is not switched off.

Ram chips may be classified as:

1. Dynamic
2. Static.

Dynamic RAM chip consist of transistors and capacitors. The charge on the capacitor must be periodically refreshed or recharged.

Static RAM chop consist of combination of transistors & resistors. Static RAM does not require special regenerator circuits to retain the stored data. More transistor and other devices are needed to store a bit static RAM. These chips are more complicated than dynamic RAM.

### **ROM (READ ONLY MEMORY)**

ROM is a permanent type memory. Its contents will not lose when power supply is switched off. Data is hardwired onto these chips at the time of manufacture and cannot be changed by the user.

Though data is hardwired, the user is able to program the following types of ROM

1. PROM
2. EPROM

### 3. EEPROM

PROM, Programmable Read Only Memory allows micro programs to be fused into them. Operations once written cannot be erased. A fused link cannot be restored. PROM can be programmed only once.

EPROM, Erasable Programmable Read Only Memory makes it possible for the user to repeatedly erase and reprogram this ROM. Exposing the EPROM to Ultra Violet rays of a specific frequency does erasing.

EEPROM, an Electrically Erasable Programmable Read Only Memory can be programmed through the use of special electrical pulses.

### **SECONDARY MEMORY**

This is of second importance, something that is dependent. Storage here refers to the safe-keeping of data, information or programs.

The secondary memory is found outside the CPU box and hence sometimes called the external memory or external storage.

1. PUNCHED CARDS
2. MAGNETIC TAPES
3. FLOPPY DISKS
4. OPTICAL STORAGE DEVICES
5. FLASH DRIVES

### **HARDWARE AND SOFTWARE**

A computer system is a combination of Hardware and Software.

### **HARDWARE**

Hardware refers to the physical components/parts of the computer such as electronic circuits, keyboards and bolts and nuts that goes to make the computers.

The physical equipments and components which we can see, touch and feel in the computer system are called as hardware.

## **SOFTWARE**

Software is the set of instructions given to the computer, which helps the computer to process data with give information. In other words, it is defined as a set of programs given to the computer.

Software is an individual or a group of programs or instructions given to the computer to perform a particular task.

Software is classified into two broad categories

1. System Software.
2. Application Software.

## **SYSTEM SOFTWARE**

System software is a set of programs that manage the resources of a computer system, control and monitor various activities and makes it easier and more efficient to use the computer.

System software consists of general programs that assist the computer in the efficient control, support, development and execution of application programs.

System software is classified into three categories.

1. System Control Software (Program that manage system resources & function).
2. System Support Software (Program that support the execution of various applications).
3. System Development Software (Program that assist system developers in designing and developing information system).

## **SYSTEM CONTROL SOFTWARE**

System control software includes programs that monitor, control, coordinate and manage the resources and functions of a computer system. The most important system control software is operating system.

## **SYSTEM SUPPORT SOFTWARE**

System support software is software that is software that supports, or facilitates, the smooth and efficient operation of a computer these one four major categories of system support software: Utility programs, language translators, database management systems & performance statistics software.

## **SYSTEM DEVELOPMENT SOFTWARE**

System development software helps system developers design and build better systems. An example is Computer – Aided Software Engineering, or CAS, a collection of programs that Assist developers in developing an information system.

## **APPLICATION SOFTWARE**

Application software is programs that work for human related tasks such as payroll, inventory and sales analysis. There are two types of application software:

1. General – purpose software.
2. Application – dedicated software.

## **GENERAL – PURPOSE SOFTWARE**

General purpose software is mass produced for a broad range of common business applications such as word processing graphics, payroll and accounting some popular general purpose software programs are word processing, desktop publishing, accounting software, etc.

## **APPLICATION – DEDICATED SOFTWARE**

Application – Dedicated software includes specialized or customized applications designed for very specific purposes. For example, software designed to cater the delivery of goods and services to a customer's door step is highly specialized.

## **Utility SOFTWARE**

Application software that assist system in doing their work is called Utility software. Thus utility software is actually a cross between system software and application software.

## **Examples for Package. (Utility software)**

WORDSTAR, DBASE, LOTUS, HG (Harvard Graphics), FOXPRO, VISUAL BASIC, MS-Word, MS-EXCEL, AUTOCAD, MS-POWERPOINT, ORACLE.

## **ROLE OF SOFTWARE**

Some of the applications for which the computer is used are

1. Letter writing
2. Publishing
3. Keeping records
4. Performing mathematical calculations
5. Painting and drawing.
6. Telecommunications.
7. Games.

## **LETTER WRITING**

Software that allows us to type any data, letter, report or a story and also allows us to make corrections on the mistakes occurred while typing without wasting paper and the human energy is called a word processor. The typed data is stored in the RAM of the computer and if there is any mistakes occurred, it can be corrected and can be saved. Then the printouts can be taken when we are satisfied by the corrections made.

The most commonly used word processors are MS-WORD, WORD PERFECT, ETC.,

### **PUBLISHING**

Publishing refers to the collection of several pieces of text, combining it with pictures and printing it in an attractive form. The most commonly found published material we read every day is the News Paper. This process is quite lengthy, messy; now software that helps in the collection and arrangement of this is called Desktop Publishing because every work can now be done on the 'top of our desk' (Commonly called as DTP). Some most popular ones are Page Maker & Ventura.

### **KEEPING RECORDS**

All the data that we collect for processing needs to be stored and the information we generate needs to be maintained. The list must be made and kept handy. If we have any new data, it must be added to the list. This is called updating the list. For maintaining a huge data like books in the library of a university, database software is available for maintaining this huge base of data.

Examples of database programs are dBASE, and Oracle.

### **PERFORMING MATHEMATICAL CALCULATIONS**

Computer is very good at handling all types of mathematical problems since it turns everything into numbers. SPREADSHEET is the main software

used to do the process and it allows to enter a lot of number and perform many types of calculations, it allows to decide which number can be added, divided or whose percentage has to be calculated. Some common spreadsheets available are EXCEL, LOTUS 1-2-3, etc.,

## **PAINTING AND DRAWING**

Drawing a straight line in computer is very easy. To draw a straight line on the computer all you have to do is make on the screen where the line should start and end. The software available for making drawings on the computer allows the artist to

Create & edit freehand drawings.

Refine parts of those drawings.

Combine 2 different drawings to produce a new one.

Fill up a drawing white colors.

Change the size of those drawings are per the user's requirements.

The popular drawing packages are Paint, Paint brush, etc.,

## **TELECOMMUNICATIONS**

The term 'telecommunication' refers to communication done over long distances. Telephones help us to talk over long distances and even across continents cable televisions allows us to watch the programs of counters across the oceans. All this is possible due to telecommunications. Specific software is now available that helps computers communicate with each other matter where they are in the world.

## **GAMES**

Playing games on the computer is one of the common uses of the computer games have gone a long way in making the computer popular. It is

one software that thrills users of all ages because of the variety of software that is available to the users.

## **READYMADE SOFTWARE**

The software which is written previously or programmed previously for general purpose and sold in shops is called readymade software.

## **INPUT DEVICES**

The purpose of having such device is to present information to the computer. The input device feed the information in to the computer.

A medium that allows the user of the computer to enter data and instructions inside the computer is called an input device.

## **KEYBOARD**

A small flat piece of plastic board with several buttons arranged on it is called a keyboard. These buttons are marked with capital alphabets from A to Z. Another set of buttons has numbers from 0 to 9 more buttons with mathematical signs like + for addition, - for subtraction, \* for multiplication, and / for division are present. Then there are some buttons that have some special sign like @, #, \$, &, \* etc. All these buttons are called keys; the arrangement of the keys on the keyboard is some as ordinary typewriter. Most computers have keyboards with 104 keys.

## **MOUSE**

Keyboards are still very popular for typing data for giving short instruction to the computer, the mouse has become very convenient. The user of the computer just has to point at the instruction that he wants the computer to carry out.



Accordance with the mouse movement, an arrow or any other symbol moves in the monitor, thus we select the command by moving arrow and press the button on the mouse. That particular command executed by pressing the button on the mouse is known as clicking the mouse.

### **BAR CODE READER**

In some articles, number of small bars is printed to represent code number and price. These are called as Bar Codes. A handy device called bar code reader can read such cods. They are connected to the computer. The user moves the bar code on the bar code reader, the computer reads the information and stores it. Then the computer calculates the value corresponding to the code and prints the bill.

### **MICR READER**

MICR means Magnetic Ink Character Recognition. MICR is a device which can sense characters as they scan the characters. It consists of characters of standard type. All the characters formed by making the correct combinations of boxes. It is used to read the details in a cheque.

### **OCR**

OCR means Optical Character Reader. OCRs scan the text optically, character by character, conquered them into a machine readable code and store the text on the system's memory. They can read at a rate of up to 2,400 characters per second. It is used for validating examination paper and application forms.

### **LIGHT PEN**

The light pen is a digital input device. It is used as a pointing device. With this device the user will point, to do an operation like drawing a line or rotating an object on a CRT. Light pen, in combination with a video screen is used to display or modify images on the screen. This is carried out by placing

the tip of the light pen, across the surface of the screen to trace the outline of the image to be displayed. The light pen is an electronic device in the form of a photo diode. The computer detects the location of the pen on the screen surface by counting the number of vertical and horizontal synchronization pulses.

### **JOYSTICK**

The joystick is used as a graphical input device. Like a mouse, it converts a user's graphics moment into changes in voltage. It also used to variable resistors to specify the movements in X and Y directions. Here the movement is caused by pushing a handle which is available on the upper portion of the joystick is similar to the mouse.

### **DIGITAL CAMERA**

A digital camera can be used to take pictures. It can be hooked up to a computer to transfer the pictures from the camera to the computer. Some digital cameras hold a floppy disk, and the floppy disk can be taken out of the camera and put directly into the computer.

### **MICROPHONE**

A microphone is used to record sound. The sound is then saved as a sound file on the computer.

### **SCANNER**

A scanner is used to copy pictures or other things and save them as files on the computer.

### **CAMERA**

Most of cameras like this are used during live conversations. The camera transmits a picture from one computer to another, or can be used to record a short video.



## **TRACKBALL**

Instead of moving the whole mouse around, the user rolls the trackball only, which is on the top or side.



## **GLIDE PAD (TOUCH PAD)**

Uses a touch sensitive pad for controlling cursor. The user slides finger across the pad and the cursor follows the finger movement. For clicking there are buttons, or you can tap on the pad with a finger. The glidepad is a popular alternate pointing device for laptops.



## **TOUCH SCREEN**

Make selection by just touching the screen.



## **OUTPUT DEVICES**

The device that will give the processed data or information to us is called the output device.

The device, which is used to communicate the processed information to the user, is called output device.

This device translates the processed data from a machine-code form to a form that can be read and used by people.

### **CATHODE RAY-TUBE (CRT)**

The working of CRT is most similar to the working of the TV screen. Here an electronic beam hits a phosphor-coated surface because of which light is emitted. By controlling the electron and its intensity, we can generate character and graphics on the screen. By employing horizontal and vertical deflection circuitry, the electron beam is more across the screen.

The traveling of electron beam from top left to bottom right of the screen, line by line is called scanning. The scanning of electron beam from left to right is called the trace. The scanning of electron beam from right to left is called retrace. A dot or a point on the screen is called pixel. Number of pixels per unit area is called resolution of the monitor. Monitor is of two types

1. Monochrome
2. Color.

In monochrome monitors, the letter appears in gray or white color. Since there is only one color being used, it is called monochrome (mono-single, chrome -color)

Color monitors can display text and pictures in all colors. Some recently developed monitors have as many shades as your TV at home.

### **GRAPHICS PLOTTER**

Plotters are used to produce output containing graphics or diagrams with the availability of multi color plotters they are increasingly used for preparing financial documents, annual reports and engineering drawings.

Plotter may use either pen or inject approach. Pen plotter is available in two forms.

1. Drum type

## 2. Flat Bed type

In drum plotter, both paper and pen moves, while in the flat bed plotter, the paper is fixed and the pen moves. The injection plotter was jets of ink with different colors and is able to produce large drawings containing many colors.

## **PRINTERS**

The paper copy obtained from a printer is often referred to as the printouts. The output can be obtained from printers are available with variety of printing mechanisms and speeds and varying quality.

Based on the printing style, the printers are classified as

1. Impact Printers
2. Non-Impact Printers.

### **IMPACT PRINTER**

Impact printers are those which have contact between the keys, the ribbon and the paper and there will a impression found on the paper due to the striking of keys.

1. Dot Matrix Printers.
2. Daisy Wheel Printers.
3. Line Printers.

### **NON – IMPACT PRINTERS**

Non Impact printers are those which have no contact between the keys, the ribbon and the paper and there will be no impression found on the paper due to the spraying method of inks.

1. Laser Printers.
2. Inkjet Printers.

### **DOT MATRIX PRINTER**

The matrix printer is another impact printer, which prints one character at a time. The print head compresses a matrix of tiny needles, usually seven rows and five columns. They are electrically driven and print characters in the form of patterns of fine dots. The pattern of dots for each character is dictated by instructions held.

### **DAISY WHEEL PRINTERS**

A daisy wheel printer is also a character printer and derives its name from the shape of the print wheel used in it. The wheel rotates at high speed and when the required character is positioned over the ribbon, a tiny hammer strikes it against the ribbon, thus transferring the character symbol to the paper. These are slow printers, with speeds ranging from 17 to 200 characters per second.

### **LINE PRINTERS**

A line printer which prints an entire line at a time instead of printing a character. It is the fastest printer. Its speed varies from 300 to 3000 lines per minute. It has been used in data processing applications for many years. They have normally 132 print positions per line. Speed is the obvious advantage of this type of printer. The major disadvantages are noise and relatively poor image quality.

### **LASER PRINTERS**

Laser printer technology has much less mechanism than impact printing, resulting in much higher speeds and quicker operation. A laser beam is directed across the surface of a light-sensitive drum and fired as needed to record an image in the form of a pattern of tiny dots. The image is then transferred to the paper, a page at a time, in the same fashion as a copy machine, using a special toner.

The major advantage of laser printers is

1. Very high speed.
2. Low maintenance required.
3. Low noise level.
4. Excellent graphics capabilities
5. A variety of type size and styles.

## **INKJET PRINTERS**

Inkjet printers work in much the same fashion as dot-matrix printers is that they form images or characters with little dots. The dots are formed not by hammer like pins, but by tiny droplets of ink. These printers almost matches the speed of dot-matrix printers, up to about 270 cps, they produce less noise and produce better latter quality. Some of the printers come with all their color inks in a cartridge, if you want to replace one color, you must replace all the colors. Other color ink-jet printers allow you to replace inks individually. These printers are better choice if you use one color predominantly.

~~~ **Best Wishes** ~~~

## **BFSC-209 Information and Communication Technology**

### **Unit – II**

#### **The Software - Introduction**

Computers need clear-cut instructions to tell them *what to do, how to do, and when to do*. A set of instructions to carry out these functions is called a *programme*. A group of such programmes that are put into a computer to operate and control its activities is called *software*. These programmes must reside in the internal storage (memory) to execute their instructions.

For example, if we want to delete some data stored in memory, the system uses one set of programme instructions. Similarly, if we want to sort a list of names, it uses another set of instructions designed to perform this task.

.The software may be broadly classified into two major categories:

- System software
- Application software

System software may include the following types of software:

- Operating system
- Language translators
- Linker programmes
- Loader programmes



- Editor programmes
- Utility programmes

Application software includes, among others, the following most popular packages:

- Word processing packages (Ex. M.S.Word, Word pad etc.,)
- Electronic spread sheet programmes (Ex.M.S. Excel)
- Database management systems (Ex. dBase IV. ForPro. etc.,)
- Graphics software (Ex. Photo shop, Flash etc.,)

## **Operating System**

The software that manages the resources of a computer system and schedules its operation is called the **operating system** . The operating system acts as an interface between the [hardware](#) and the user programmes and facilitates the execution of the programmes. The principal functions of operating system includes :

- Memory management
- Processor management
- Device management
- Security
- Co-ordinating between the user and the software
- File management
- Error detecting
- System performance control
- Job accounting

## **Utility Programmes**

There are many tasks common to a variety of applications. Examples of such tasks are:

- Sorting a list in a desired sequence.
- Merging of two programmes.
- Copying a programme from one place to another
- Report writing.

## Language Translators

Computers can understand instructions only when they are written in their own language called the **machine language** . Therefore, a programme written in any other language should be translated into machine language.

Special programmes called *language processors* are available to do this job. Language processors are also known as **translators**. There are three forms of translators:

- Compilers
- Interpreters
- Assemblers

## Compiler

A **compiler** checks the entire user-written programme (known as the **source programme** ) and if error-free, produces a complete programme in machine language (known as **object programme** ).

## Interpreter

An **interpreter** does a similar job but in a different style. The interpreter (as the name implies) translates one statement at a time, and if error-free, executes it. This continues till the last statement. Thus an interpreter translates and executes the first instruction before it goes to the second, while a compiler translates the whole programme before execution.

## Assembler

As the computer understands only machine-code instructions, a programme written in assembly language must also be translated into machine language before the programme is executed. This translation programme is called the **assembler** .

### **Linker and Loader Programmes**

A **linker** is a system programme that links modules or programme segments together so that they can refer to one another.

A **loader** is also a system programme that loads programmes stored in a programme library into memory for execution. An example of a loader is the **bootstrap** loader that brings the operating system from the disk and loads it into the memory.

### **Editor programmes**

An **editor** is a system programme that is used to type in and edit text or programme statements. All operating systems contain their own editors. Word processing packages can also be used as editors.

### **Programming Languages**

We have stated earlier that the functioning of a computer is controlled by a set of instructions (called a **computer programme** ). These instructions are written to tell the computer:

- What operation to perform?
- Where to locate data?
- How to present results?
- When to make certain decisions? and so on.

The language used in the communication of computer instructions is known as the **programming language**. The computer has its own language

and any communication with the computer must be in its language or translated into this language. Three levels of programming languages are available.

Machine languages (low level languages)

Assembly (or symbolic) languages

Procedure-oriented languages (high level languages)

### **Machine Language :**

Computers are made of two-state electronic components which can understand only pulse and no-pulse (or '1' and '0') conditions. Therefore, all instructions and data should be written using **binary codes 1** and **0** . The binary code is called the **machine code** or **machine language**.

Computers do not understand English, Hindi or Tamil. They respond only to machine language. Added to this, computers are not identical in design. Therefore, each computer has its own machine language.

### **Features of Machine Language**

1. Machine dependent
2. Difficult programming
3. Requires no language translator
4. Program execution is fast
5. Detailed knowledge is required
6. More error prone
7. Difficult program debugging

8. Low productivity

9. Less hardware resources required

### **Advantages of Machine Level Languages**

1. Machine languages makes fast and efficient use by the computer

2. It requires no translator to translate the code. It is directly understood by the computer.

### **Disadvantages of Machine Level Languages**

1. First, it is a difficult experience to understand and remember the various combinations of 0,1s and **is** representing numerous data and instructions. Also, writing error-free instructions is a slow process.

2. Secondly, since every machine has its own machine language, the user cannot communicate with other computers (if he does not know its language).

### **Assembly language**

uses mnemonic codes rather than numeric codes (as used in machine language). For example, ADD or A is used as a symbolic operation code to represent addition and SUB or S is used for subtraction. Memory locations containing data are given names such as TOTAL, MARKS, TIME, MONTH and the like.

### **Features of Assembly Language:**

1. Machine dependent
2. Easy programming as compared to machine
3. Requires language translator (assembler)
4. Program execution is slow as compared to machine
5. Detailed knowledge is required
6. More error prone
7. Difficult program debugging
8. High productivity as compared to machine
9. More hardware resources are required as compared to machine

#### **Advantages of Assembly Language:**

1. It allows complex jobs to run in a simpler way.
2. It is memory efficient, as it requires less memory.
3. It is faster in speed, as its execution time is less.
4. It is mainly hardware oriented.
5. It requires less instruction to get the result.
6. It is used for critical jobs.
7. It is not required to keep track of memory locations.
8. It is a low-level embedded system.

#### **Disadvantages of Assembly Language:**

1. It takes a lot of time and effort to write the code for the same.

2. It is very complex and difficult to understand.
3. The syntax is difficult to remember.
4. It has a lack of portability of program between [different computer architectures](#).
5. It needs more size or memory of the computer to run the long programs written in Assembly Language.

### **Procedure-Oriented Language (POL) (High level languages)**

These languages consist of a set of words and symbols and one can write programmes using these in conjunction with certain rules like 'English' language. These languages are oriented towards the problem to be solved or procedures for solution rather than mere computer instructions. These languages are more user-centred rather than machine-centred . They are better known as ***high level languages*** .

Many high-level languages have been developed during the last four decades: The most common high-level languages are FORTRAN, BASIC, COBOL, C, PL/1, C++ and Java.

**The features** that a programming language must have to stand out are the following:

- **Simplicity:** the language must offer clear and simple concepts that facilitate its learning and application, in a way that is simple to understand and maintain. Simplicity does not mean that it can be subtracted from the optimal power of functioning.
- **Naturalness:** this means that its application in the area for which it was designed must be done naturally, providing operators, structures and syntax for operators to work efficiently.

- **Abstraction:** it is the ability to define and use complicated structures or operations while ignoring some details, which influences writing ability.
- **Efficiency:** Programming languages must be translated and executed efficiently so as not to take up too much memory space or require too much time.
- **Structuring:** the language allows programmers to write their codes according to structured programming concepts, to avoid creating errors.
- **Compactness:** with this characteristic, it is possible to express operations concisely, without having to write too many details.
- **Locality:** refers to the codes concentrating on the part of the program with which you are working at a given time.

### **Advantages of Procedure-Oriented Language (POL) (High level languages)**

1. High level languages are programmer friendly. They are easy to write, debug and maintain.
2. It provide higher level of abstraction from machine languages.
3. It is machine independent language.
4. Easy to learn.
5. Less error prone, easy to find and debug errors.
6. High level programming results in better programming productivity.

### **Disadvantages of Procedure-Oriented Language (POL) (High level Languages)**

1. It takes additional translation times to translate the source to machine code.
2. High level programs are comparatively slower than low level programs.
3. Compared to low level programs, they are generally less memory efficient.
4. Cannot communicate directly with the hardware.

### **Problem Solving and algorithms**

In every instance of problem solving, the computer cannot be used to solve the problem until a method of solution has been evolved and a detailed



procedure has been prepared by the user. It is assumed that the user has a certain amount of background, knowledge, knows certain facts about the problem and possesses sufficient deductive and reasoning skills.

### **Problem solving involves the following steps:**

1. Studying the problem in detail,
2. Redefining or restating the problem,
3. Identifying output requirements, input data available and conditions and constraints to be used,
4. Comparing different methods of solution,
5. Selecting the method which is considered to be the best,
6. Preparing a logical and concise list of procedures or steps necessary for solving the problem,
7. Computing the results, and
8. Examining the results for correctness.

The logical and concise list of procedures for solving a problem is called an **algorithm**. It describes the steps that lead to unambiguous results in a finite number of operations. An algorithm prepared for the first time might need review to:

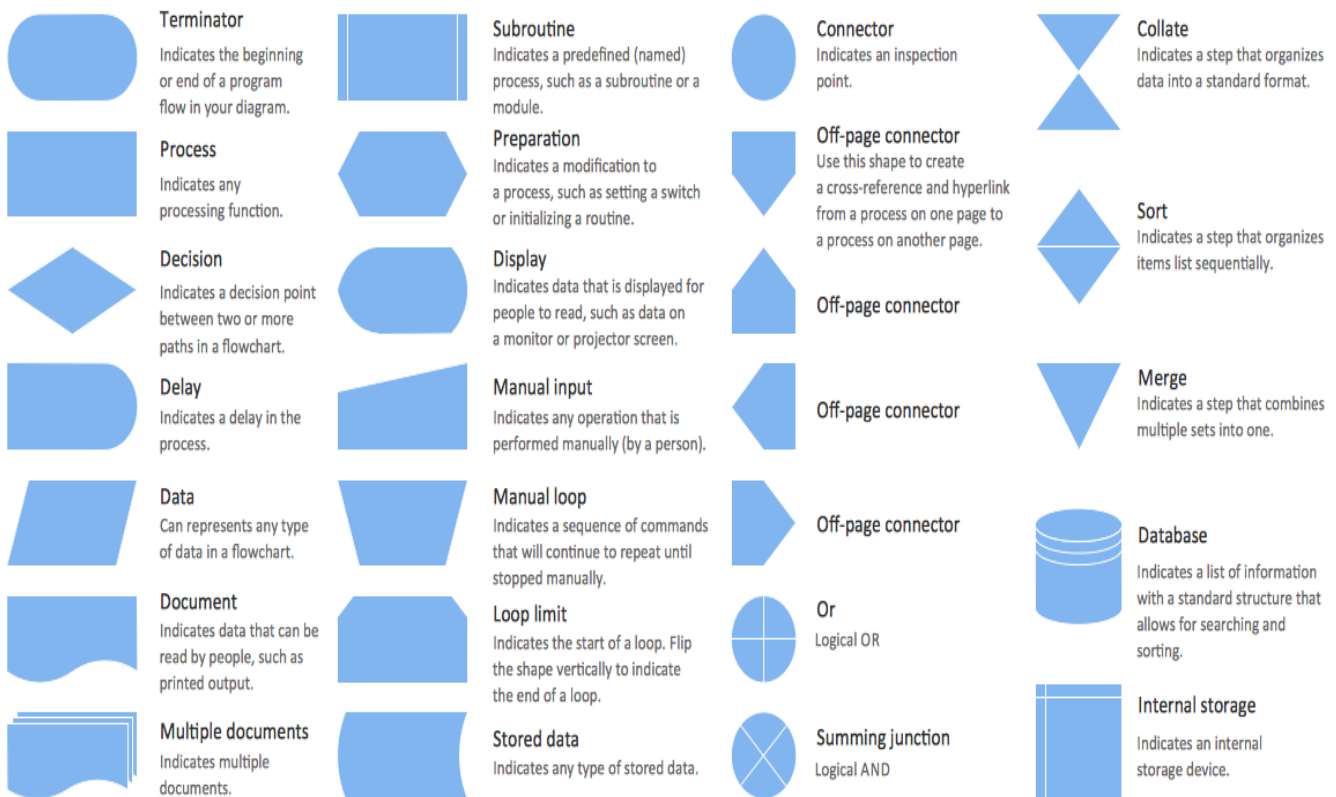
- Determine the correctness of various steps,
- Reduce the number of steps, if necessary, and
- Increase the speed of solving the problem.

### **Flow Charting**

When organising a problem for computer solution, it is desirable to present the algorithm pictorially. A **flowchart** is a diagram that outlines the sequence of operations to be performed. The operating steps are placed in

boxes that are connected by arrows to indicate the order of execution of steps. The important functions of a flowchart are:

- It provides a graphic representation of the problem so that it is easier to understand the plan of solution.
- It provides a convenient aid to writing computer instructions (programme).
- It assists in reviewing and correcting the programme.
- It helps in discussion of the solution logic with others.



## BFSC-209 Information and Communication Technology

### Unit – III

**Syllabus** - Operating systems (OS) - definition, basic concepts, introduction to WINDOWS and LINUX Operating Systems.

## **OPERATING SYSTEM (OS)**

The software that manages the resources of a computer system and schedules its operation is called the **operating system**. The operating system acts as an interface between the hardware and the user programs and facilitates the execution of the programs. It not only coordinates the operations of hardware units such as CPU, memory, keyboard, video display system, and disk drives but also provides an interface for users to communicate with the computer and run application programs.

The principal functions of operating system includes :

- Memory management
- Processor management
- Device management
- Security
- Co-ordinating between the user and the software
- File management
- Error detecting
- System performance control
- Job accounting
- Providing user interface, either command-line or graphical for communicating with the computer.
- Managing the hardware devices of the computers.
- Managing and maintaining the disk files
- Supporting the running of application programs.

## Concepts of Operating System

An Operating System (OS) is an interface between a computer user and computer hardware. An operating system is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.

- **Security** – By means of password and similar other techniques, it prevents unauthorized access to programs and data.
- **Control over system performance** – Recording delays between request for a service and response from the system.
- **Job accounting** – Keeping track of time and resources used by various jobs and users.
- **Error detecting aids** – Production of dumps, traces, error messages, and other debugging and error detecting aids.
- **Coordination between other software and users** – Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

## Components of OS and their functions

The operating system is a collection of programs and sub-programs ( *known as routines* ) that are designed to carry out various tasks. They include:

Bootstrap program

Diagnostic program

Monitor program

BIOS program

Utility program

File maintenance program

### Bootstrap Program

Bootstrap loader program is usually contained in the ROM memory. Its task is to load the main portion of the operation system residing in the secondary memory into the main memory, when the computer is first switched on. This operation is known as *booting* the computer.

### **Diagnostic Programs**

These programs test the operation of the system components. For instance, one program may check the conditions of the disk while the other checks the RAM.

### **Monitor Program**

This program monitors and controls the activities of various units and assigns tasks to them. It also monitors user requests and schedules the execution of application program - mes. The monitor program is also known as the *operating system executive*.

### **BIOS Program**

This program ( *Basic Input/output System* ) contains a number of subprogram me that control some' basic operations of input output devices, such as reading from the keyboard and writing to the printer.

### **Utility Programs**

These programs are used to perform 'housekeeping' functions such as formatting a disk, copying the contents of a disk, determining the space available in a disk and so on.

### **File Maintenance Programs**

These programs are used to maintain files on the secondary storage units attached to the computer. They enable users to create, read, and write files.

## **Types of Operating Systems**

Operating systems are designed not only to manage [hardware](#) but also serve the users in a variety of environments. Operating systems depending on how they handle user programs may be categorised as follows:

- Batch operating systems
- Multi-user operating systems
- Multitasking operating systems
- Multiprocessing operating systems
- On-line operating systems
- Real time operating systems

### **Batch systems**

In batch processing, the system reads in a job, passes controls to this job, and when the job is completed, the controls to the next job. Most of the early computers used batch processing operating systems. Such operating systems were *called resident monitors*.

### **Multi-user systems**

A multi-user operation system is designed to allow more than one user to access and use a computer at the same time. In this case, the [CPU](#) time is shared by the users working simultaneously. Since the same processor caters the needs of many users (using time-slicing technique) the response time will decrease when the numbers of users increase. Such systems are also known as *time-sharing systems*.

### **Multitasking systems**

The ability of an operating system to handle more than one task at a time is called *multitasking (or multithreading)*. This capability, for example, allows us to print documents in the background, or to sort a database while preparing a letter using a word processor. Multimedia applications require as with multitasking capabilities. Such systems which can run two or more independent programs concurrently are also called *multiprogramming systems* .

### **Multiprocessing Systems**

An operating system that can manage a series of CPUs working together is known as *multiprocessing operating system*. Such systems increase the overall power of the computer. These systems are also called *parallel processing systems*.

### **On-line Systems**

In on-line operation, the computer system is on-line and the program that is used to process the data resides in the internal memory continuously. The system executes the program as and when the data is available. This kind of facility is very useful in implementing systems such as railway reservation system. An on-line system may be a single-user or multi user system.

### **Real-time Systems**

There are situations where computers are used to control some physical systems such as process control systems. In such systems, a computer operates in *real-time* that is, the computer receives signals, processes them instantly and takes control action immediately. Real-time operating systems have to respond within a specified time limit.

**WINDOWS**

## **Windows - Introduction**

The windows operating system started with the introduction of Windows OS and Windows for work group for networking. Since then it has come a long way and Windows 95, 98 and 2000, windows XP, Vista family of operating systems were introduced. It provided the computer user with the most integrated and easy to use operating system with all the facilities in built. One of the most significant areas of improvement in Windows XP over Windows 2000 is management and administration of desktop

Windows is an operating environment and it is developed by Microsoft Corporation.

### **Versions of windows**

- Windows 1.0 to 2.0 (1985-1992) windows 1.0 allowed users to point and click to access the windows.
- Windows 3.0 (1990-1994) windows 1.0 allowed users to point and click to access the windows.
- Windows 3.1
- Windows 95 (1995) Windows 95 also includes a number of important internal improvements. Perhaps most important, it supports 32-bit applications, which means that applications written specifically for this operating system should run much faster.
- Windows 98 (1998) offers support for a number of new technologies, including FAT32, AGP, MMX, USB, DVD, and ACPI. Its most visible feature, though, is the Active Desktop, which integrates the Web browser (Internet Explorer) with the operating system



- Windows ME ( Millennium Edition 2000) This version also removed the "boot in DOS" option.
- Windows 2000 (2000) Often abbreviated as "W2K," [Windows 2000](#) is an operating system for business desktop and laptop systems to run software applications, connect to Internet and intranet sites, and access files, printers, and network resources.
- Windows NT (New Technology) (1993-1996) Windows NT Server, designed to act as a server in networks, and Windows NT Workstation for stand-alone or client workstations.
- Windows XP (2001) Microsoft focused on mobility for both editions, including plug and play features for connecting to wireless networks. The operating system also utilizes the [802.11x](#) wireless security standard. Windows XP is one of Microsoft's best-selling products.
- Windows Vista (2006) features to protect against the latest generation of threats, faster start-up time and low power consumption of the new sleep state. In many cases, Windows Vista is noticeably more responsive than Windows XP on identical hardware. Windows Vista simplifies and centralizes desktop configuration management, reducing the cost of keeping systems updated.
- Windows 7 (2009) include multi-touch support,
- Windows 8 (2012) was released on August. 1, 2012 and is a completely redesigned operating system that's been developed from the ground up with touchscreen use in mind as well as near-instant-on capabilities that enable a Windows 8 PC to load and start up in a matter of seconds rather than in minutes.
- Windows 10 (2015) This version of Windows will also feature Microsoft Edge, Microsoft's new browser. Any qualified device (such as tablets, PCs, smartphones and Xbox consoles) can

upgrade to Windows 10, including those with pirated copies of Windows.

## Features of Windows

### **Graphical User Interface (GUI)**

Windows can support Graphical User Interface through which a user can easily interact with the computer. It uses icons, pictures, graphics instead of characters and text. It makes the uses to use the system friendly.

### **Similarities**

In windows, the common activities are done using same procedures in all application. For example, the procedure to save a file, print a file, open file, quit out from an application will be same for all windows based applications. So the user can study quickly.

### **Multitasking**

Multitasking is the process of working with more than one application at a time. We can switch from one application to another. Windows can support multitasking effectively. For example, we can work in word processor and at the same time we can open the calculator to do some calculations. Similarly we can work with a spread sheet application while printing a document in word processor.

## Components of Windows

### **Desktop**

This is the background on which all other elements appear. You can think of the Windows desktop like the top of your own traditional office desk. Just as you can move

papers around, hide certain items in drawers, and add and remove things on your desk, you can manipulate items on your Windows desktop.

## **Icons**

Icons are pictures that represent programs (the Internet, Word for Windows, Excel, and so on), folders, files, printer information, computer information, and so on, in both Windows 95 and Windows applications. Most often, you use icons to open folders and files.

## **My Computer**

The My Computer icon represents the contents of your computer, including the hard drive, floppy and CD drives, applications, folders, files, and so on. Double-click an icon to open it and view its contents.

## **Network Neighbourhood**

This icon displays other computers connected to your computer on a Microsoft or other type of network, such as NT or Netware.

## **The Internet**

If you have access to an Internet Service Provider , you can use the Internet Explorer to access the Net , including Web pages and e-mail.

## **Recycle Bin**

The Recycle Bin is a place in which deleted objects remain until you empty the trash. You can retrieve items-files, programs, pictures, and so on-from the Recycle Bin after you delete them. Once you empty the trash, however, you can no longer retrieve items from the bin.

## **Taskbar**

The taskbar contains the Start button, any open application or window buttons, and the time. You can click a taskbar button to open the window or application it represents. Use the Start button to open programs, documents, help, and so on.

## **Start button**

The Start button displays a menu from which you can choose to open an application, open a document, customize Windows, find a file or folder, get help, or shut down the Windows 95 programs.

## **Folder**

A folder contains files, programs, or other folders on your computer; for example, the Online Services folder contains programs that let you sign up for an online service like CompuServe. A folder is the same thing as a directory.

## **Using the mouse**

You use the mouse to perform many actions in windows and in windows applications. To select an icon or folder single click on that object and also to open an icon or folder double clicks on that object. Double clicking means pressing and releasing the mouse left button twice quickly. Right mouse button can be used to display shortcut menu or quick menu. To move an object (folder or icon or window) by dragging. Dragging means selecting the object and move to that object into new location.

## **Using the Start Button**

The windows start button provides access to programs and documents, the help feature, and many other elements in windows 98.

## **MS Paint**

MS Paint is an application in accessories group. It is a graphics tool for constructing pictures. We can select colour for a picture, modify the picture, put text in picture and also we can print the picture. Tool box has several basic tools which can be used to draw the pictures. A tool can be selected from the tool box by clicking it. The thickness of the line can be selected using Line size selector. Colours can be giving to pictures using Colour Palette. MS Paint pictures is saved as a [bit](#) map file (BMP).

## **Clock**

Clock is a small program in accessories which displays the current system time and system date. There are two types of clock display. They are analog, digital. Analog display, the clock as a picture. Digital display the time and date in digits. We can set font for the digital display. We can also control the display of seconds in time and date display.

## **Calculator**

It is similar to real life calculator. There are two type of calculator. They are standard and scientific. In standard calculator, we can perform addition, subtraction, multiplication, division etc. In scientific calculator, we can perform sin, cos, tan, log, factorial, decimal to binary, binary to octal, and, or, not etc. Calculator result can be copied to clipboard using copy option in edit menu.

## **Calendar**

Calendar is small program which can be used to store the appointment on a particular day or time. We can view the day wise or time wise appointments for any date. In day wise display, we can mark the important days with different symbols. In time wise display we can set alarm at a particular time.

## **Control Panel**

Control is used to change system settings (Screen, keyboard, mouse, Date, Time...etc).

### ***To open Control Panel***

1. Click the start button and then Choose Settings, Control Panel.
2. From the desktop, double click My Computer and then double click the Control Panel folder icon.
3. From Windows Explorer, click the Control Panel folder found in the left pane of the window. The contents of the control panel appear in the right panel.

**Printer:** It is used to add a new Printer in the system.

### **Date & Time**

1. Double click the Date/Time icon in control panel. The Date/time properties box appears.
2. In the date section of the dialog box, click the Month box to select the current month or any month from the dropdown list.
3. Use the small up and down arrows to change the year or enter the current year in the year box.
4. In the Time box, click the time component you want to change (the hours, minutes, seconds, or am/pm). Use the small up and down arrows to adjust the settings.

### **Windows Explorer**

It is used to view and organize your drives, folders and files. The list of drives and folders is on the left, and the contents of the selected folder or drive is on the right.

## **Opening the explorer**

1. Click the start button on the taskbar, select programs, Windows Explorer.
2. Right click on the start button and select Explore option in the shortcut menu.

## **My Computer**

It is a way to quickly see everything on your computer files, folders, and drives and how it's organized. Some of the icons in the My Computer window represent drives, such as floppy drive , hard drive, or CD ROM drive,control panel icon and printer icon.

## **Recycle Bin**

Recycle Bin is a temporary storage area on your [hard disk](#). When you delete a file, Windows moves it into the Recycle Bin. However, the file or folder still takes up space on the [hard disk](#) you must empty the Recycle Bin to remove the file from the drive.

## **Network Neighbourhood**

It displays the resources available to you in your work group; the Entire Network folder, whose icon appears in the Network Neighbourhood folder, displays your access to the resources shared by computers outside your workgroup.

# LINUX

## Introduction

Linux is the first truly free Unix-like operating system. The underlying GNU Project was launched in 1983 by *Richard Stallman* originally to develop a Unix-compatible operating system called GNU, intended to be entirely free software. Many programs and utilities were contributed by developers around the world, and by 1991 most of the components of the system were ready but kernel was missing.

Linus Torvalds invented Linux itself. In 1991, Torvalds was a student at the University of Helsinki in Finland where he had been using [Minix](#), a non-free Unix-like system, and began writing his own kernel. He started by developing device drivers and hard-drive access, and by September had a basic design that he called Version 0.01. This kernel, which is called Linux, was afterwards combined with the GNU system to produce a complete free operating system.

The kernel was then rapidly improved by Torvalds and a growing number of volunteers communicating over the [Internet](#), and by December 19th a functional, stand-alone Unix-like Linux system was released as Version 0.11. After that Linux became an underground phenomenon, with a growing group of distributed programmers that continue to debug, develop, and enhance the source code baseline to this day.



Torvalds released Version 0.11 under a freeware license of his own devising, but then released Version 0.12 under the well-established GNU General Public License. More and more free software was created for Linux over the next several years.

Linux continued to be improved through the 1990's, and started to be used in large-scale applications like web hosting, networking, and database serving, proving ready for production use. Version 2.2, a major update to the Linux kernel, was officially released in January 1999. By the year 2000, most computer companies supported Linux in one way or another, recognizing a common standard that could finally reunify the fractured world of the [Unix Wars](#). The next major release was V2.4 in January 2001, providing (among other improvements) compatibility with the upcoming generations of Intel's 64-bit Itanium computer processors.

Linux is licensed under the GPL (General Public license) from the GNU organization, under which the kernel is provided with the source code, and is available for free. As a result, Linux is considered to be more secure and stable than closed source or proprietary systems like windows because anyone can analyze the source code written in the C language and find bugs or add new features. One important point that should be note is that even though the source is free, anyone is allowed to sell it for profit.

## **Distribution**

Linux is known as an open source operating system and also called free software because everything about Linux is accessible to the public and is freely available to anyone. Since the Linux source code is available, anyone can copy, modify, and distribute this software. When people use the name Linux they are probably referring to a particular distribution of Linux. There are several software packages provided for Linux over the Internet but selecting and downloading one is complicated task not necessarily manageable for new users who want to try out Linux. This is exactly where a distribution kicks in.

A **Linux distribution** (also called **GNU/Linux distribution** by some vendors and users) is a member of the family of Unix-like software distributions built on top of the Linux kernel . A distribution is a set of software packages that are tested and provided on CD by a company for a small fee. The advantages of using distributions are the support and manuals, as well as the fact that Linux can be specialized for use in a particular area. Linux distributions have taken a wide variety of forms — from fully featured desktop and server operating systems to minimal environments (typically for use in embedded systems , or for booting from a floppy disk).

## Understanding Linux

Life in any operating system begins and ends with Kernel. It is a program that constitutes the central core of a computer operating system. It has complete control over everything that occurs in the system.

### Principle functions of the Linux

- File management
- Multitasking
- Memory management
- I/O management
- Process management
- Device management
- Networking support including IPv4 **and IPv6**
- Advanced features such as virtual memory, shared libraries, demand loading, shared copy-on-write executable etc .

## What is Linux Shell

Computer understands the language of 0's and 1's called binary language. In early days of computing, instructions are provided using binary language, which is difficult for

all of us, to read and write. So the special program is called Shell. Shell accepts your instruction or commands in English (mostly) and if it is a valid command, it passes on to kernel. Shell is a command language interpreter that executes commands read from the standard input device (keyboard) or from a file. It is not part of system kernel, but uses the system kernel to execute programs, create files.

## **File Structure & File Handling in linux**

### **What is a File?**

File is collection of data items stored on disk. Or it's device which can store the information, data, music (mp3), picture, movie, sound, book etc. In fact whatever you store in computer it must be in form of file. Files are always associated with devices like [hard disk](#), floppy disk etc. File is the last object in your file system tree. The general rules for [naming file and directory names](#) .

1. All file names are case sensitive.
2. You can use upper and lowercase letters, numbers, "." (dot), and "\_" (underscore) symbols.
3. Most modern Linux limit filename to 255 characters

Linux reserved character should not be used /, >, <, |, : and & for naming file name .

### **Understanding Basic Linux Directories**

Directory is group of files. Directory is divided into two types:

- Root directory - There is only one root directory in your system, which is denoted by / (forward slash). It is root of your entire file system and cannot be renamed or deleted.

- Sub directory - Directory under root (/) directory is subdirectory which can be created, renamed by the user.

### **Directories are used to organize your data files, programs more efficiently**

Everything starts from the root directory, represented by '/', and then expands into sub-directories. Linux places all the partitions under the root directory by 'mounting' them under specific directories. Closest to root under Windows would be c:.

Under Windows, the various partitions are detected at boot and assigned a drive letter. Under Linux, unless you mount a partition or a device, the system does not know of the existence of that partition or device. This might not seem to be the easiest way to provide access to your partitions or devices but it offers great flexibility.

We now move on to the layout or the directory structure of the Linux file system. Given below is the result of a 'ls -p' in the root directory.

| <b>Directory</b> | <b>Content</b>                                                                                                                                                                                                                                        |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| /                | The root directory, starting point                                                                                                                                                                                                                    |
| /bin             | This directory contains several useful commands that are used by both the system administrator as well as non-privileged users. This directory usually contains the shells like bash, csh etc. as well as much used commands like cp, mv, rm, cat, ls |
| /boot            | This directory contains the system.map file as well as the Linux                                                                                                                                                                                      |

|       |                                                                                                                                                                                                                                                                                                                                              |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | kernel. Lilo places the boot sector backups in this directory. It requires for system start-up                                                                                                                                                                                                                                               |
| /dev  | This is a very interesting directory that highlights devices like hda1, hda2 etc, which represent the various partitions on the first master drive of the system. /dev/cdrom and /dev/fd0 represent CDROM drive and floppy drive. /dev/dsp, file represents speaker device. So any data written to this file will be re-directed to speaker. |
| /etc  | Most important system configuration files are in this directory contains data similar to those in the Control Panel in Windows                                                                                                                                                                                                               |
| /home | Linux is a multi-user environment so each user is also assigned a specific directory which is accessible only to them and the system administrator. These are the user home directories, which can be found under /home/username                                                                                                             |
| /lib  | Shared Library files, Kernel modules.                                                                                                                                                                                                                                                                                                        |
| /mnt  | Standard mount point for external file systems, e.g. a CD-ROM or a digital camera.                                                                                                                                                                                                                                                           |
| /opt  | Add-on software packages                                                                                                                                                                                                                                                                                                                     |

|       |                                                                                                                                                                                                                                                                                                                           |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| /root | The administrative user's home directory                                                                                                                                                                                                                                                                                  |
| /sbin | System commands, generally accessible to administrator                                                                                                                                                                                                                                                                    |
| /tmp  | Temporary space for use by the system                                                                                                                                                                                                                                                                                     |
| /usr  | This is one of the most important directories in the system as it contains all the user binaries. X and its supporting libraries can be found here. User programs like telnet, ftp etc are also placed here. /usr/doc contains useful system documentation. /usr/src/linux contains the source code for the Linux kernel. |
| /var  | Storage for all variable files and temporary files created by users, such as log files, the mail queue, the print spooler area, space for temporary storage of files downloaded from the Internet.                                                                                                                        |

**Network Setup**

Unselect the DHCP option and be sure to set a host name manually. You can always add or change network configurations later by typing at the Linux command prompt: netconfig

Manually type the system's IP address and host name.

Just type in your machine's IP and netmask into the available fields. Choose Language

Just choose a language and move on! Time zones

Always choose the right time zone.

Creating Root and New User

Full access login on any Linux server is root by default. Also, take time to add an additional login account to your server. You may do this by pressing the Add button or the new user option.

Once the installation is complete, the system will reboot and start up with Linux. There are a series of messages on the screen while booting of the system regarding the [hardware](#) enabled, services started etc. After a while, the system will display a login: prompt. You can now log in.

Some systems are configured to start graphical mode with a box in the middle containing both login: and Password: prompts. Press [CTRL]-[ALT]-[F1] to switch to the virtual console (text login screen), where you can log in to the system in the usual way.

## **Accounts and Privileges**

Linux is a multi-user system, meaning that many users can use one Linux system simultaneously, from different terminals. So to avoid confusion, each user's workspace must be kept separate from the others.

Even if a particular Linux system is a stand-alone personal computer with no other terminals physically connected to it, it can be shared by different people at different times, making the separation of user workspace is important.

This separation is accomplished by giving each individual user an account on the system. You need an account in order to use the system; with an account you are issued an individual workspace to use, and a unique username that identifies you to the system and to other users. It is the name along with the password by which the system will recognize the user.

## **Logging in to the System**

To begin a session on a Linux system, you need to log in. Do this by entering your username at the login: prompt on your terminal, and then entering your password when asked.

Every Linux system has its own name, called the system's hostname; a Linux system is sometimes called a host, and it identifies itself with its hostname at the login: prompt. It's important to name your system -- like a username for a user account, a hostname gives name to the system you are using (and it becomes especially important when putting the system on a network). The system administrator usually names the system when it is being initially configured (the hostname can be changed later; its name is kept in the file `/etc/hostname`). The name of the terminal you are connecting from is displayed just after the hostname.

To log in to the system, type your username (followed by) at the login: prompt, and then type your password when asked (also followed by); for security purposes, your password is not displayed on the screen when you type it.

Once you've entered your username and password, you are "logged in" to the system. You can then use the system and run commands. As soon as you log in, the system displays the contents of `/etc/motd`, the "Message of the Day" file. The system then displays the time and date of your last login, and reports whether or not you have electronic mail waiting for you. Finally, the system puts you in a shell the environment in



which you interact with the system and give it commands. Bash is the default shell on most Linux systems.

The dollar sign (' \$') displayed to the left of the cursor is called the shell prompt; it means that the system is ready and waiting for input. By default, the shell prompt includes the name of the current directory.

### **Logging Out of the System**

To end your session on the system, type `logout` at the shell prompt. This command logs you out of the system, and a new login: prompt appears on your terminal.

- To log out of the system

#### **logout**

You can also logout by just pressing `Ctrl+d`.

### **3.4.10 Linux Basic Commands**

#### Making a Directory

Use `mkdir` ("make directory") to make a new directory, giving the path name of the new directory as an argument.

To make a new directory called 'ict' in the current working directory

```
$ mkdir ict
```

To make a new directory called 'ict' in the '/tmp' directory

```
mkdir /tmp/ict
```

### **3.4.11 Changing Directories**

Use `cd` to change the current working directory; give the name of the target directory as an argument. For an example to change the current working directory to 'work', a subdirectory in the current directory

**\$ cd work**

To change to parent directory \$ `cd .`

You can also give the full path name of a directory. To change the current working directory to `./usr/doc`

**\$ cd /usr/doc**

Basic command

\$ `pwd` : getting the name of the current directory

\$ `ls` : Listing the directories

\$ `tree` : Listing the directory tree graphs

\$ `cp <file 1> <file 2>` : copy file1 and create file2

\$ `mv file1 /ict` : moves file1 to specified directory

\$ `rm file1` : Delete a file

\$ `rm <directory>` : Delete a directory ( if empty)

\$ `gzip xyz` : To compress xyz

\$ `gunzip xyz.gz` : Decompressing a file

\$ `tar -cvf fl project` : To create an archive called 'project.tar' from the contents of the project directory

\$ tar -tvf project.tar : To list the contents of an archive called 'project.tar'

\$ tar -xvf project.tar : To extract the contents of an archive called 'project.tar'

\$ mke2fs /dev/fd0 : To format a floppy disk in the first removable floppy drive

\$ mount /dev/fd0 /mnt/floppy : Mounting a Floppy Disk

\$ umount /mnt/floppy : UnMount a Floppy Disk

## **vi editor commands**

The VI editor is a screen-based editor used in Linux. The VI editor has powerful features to aid programmers to write the program. It lets a user create new files or edit existing files. The command to start the VI editor is vi, followed by the filename. For example to edit a file called *temporary*, you would type vi temporary and then return. You can start VI without a filename, but when you want to save your work, you will have to tell VI which filename to save it into later.

### **Simple VI Commands**

Enter *insert* mode, the characters typed in will be inserted after the current cursor position. If you specify a count, all the text that had been inserted will be repeated that many times.

#### **h Move the cursor to the left one character position.**

Enter *insert* mode, the characters typed in will be inserted before the current cursor position. If you specify a count, all the text that had been inserted will be repeated that many times.

j Move the cursor down one line.

k Move the cursor up one line.

l Move the cursor to the right one character position.

r Replace one character under the cursor. Specify *count* to replace a number of characters

u Undo the last change to the file. Typing u again will re-do the change.

x Delete character under the cursor. *Count* specifies how many characters to delete. The characters will be deleted after the cursor.

Esc + wq For saving the current file

Esc + dd For deleting the current line

Esc + yy For copying the current line

Esc + p For pasting the last cut or copied text

Esc + u For undoing the last change

Esc + :wq For quitting the file without saving

## Unit – IV

**Syllabus** - Local area network (LAN), Wide area network (WAN), Internet and World Wide Web, HTML and IP. Introduction to MS Office - Word, Excel, Power Point.

### Local Area Networks (LAN)

A network of computers and other devices located relatively close to each other in an office (or in a building) and connected by a wire (or a wireless link) is called a **local area network (LAN)**. A LAN may include two or more computers, storage devices, printers and other peripherals connected together to share resources.

A LAN enables the users of individual computers to share software and data of other computers in the network. The most common [hardware](#) resources that are shared among the computers are storage devices and printers that are connected to the network. A storage device that is shared by all the computers is called **the file server**. Each computer in the network can also work independently of the others. A computer (or any other device) connected to the networking cable is called a **node**.

Local area networks are most efficient when they serve a large number of users in a limited area, usually within a radius of 2 km. Large office buildings, college campuses and industrial complexes often use such networks.

### Wide Area Networks (WAN)

A network that connects two or more LANs spread across a large geographical area is called a **wide area network (WAN)**. For instance, a company may use a LAN at its headquarters in one city, another LAN at its manufacturing site and the third LAN in the marketing office located in another city. Each location needs resources, data, and programmes locally but 'it also requires to use data available in other locations. In such situations, all the

three LANs may be connected to form a wide area network. LANs may be connected together by dedicated telephone lines, or fibre-optic cables, or by satellite links (or a combination of them). Each computer system within a WAN or LAN is called a *node*.

### **Metropolitan Area Networks (MAN)**

Metropolitan area Networks (MANs), a relatively newcomer, are the networks that are in between LANs and WANS. These networks are created to provide city-wide services in large cities and thus the name ***metropolitan***. MANs fill the need of extending LAN capabilities to larger geographic areas. They are used to connect LANs across different offices in a city or to link LANs to WANS.

### **INTERNET**

#### **What is Internet?**

The internet is a world wide collection of computer networks connecting academic governmental, commercial and organizational sites. It provides access to communication services and Information resources to million of users around the globe. One of the important facts about the internet is that nobody really owns it. It is global collection of networks. The internet society is a non profit group, the formation of policies and protocol that define how we use and interact with the internet. Every computer that is connected to the internet is part of a network even the one in your home.

Internet is the world's largest computer network, the network of networks, scattered all over the world

### **Intranet**

Another popular buzz word used today is ***intranet***. It is the generic term for a collection of private computer networks within an organization. An intranet uses network technologies as a tool to facilitate communication between people or workgroups to improve the data sharing capability and overall knowledge base of an organization's employees. It uses the same tools and protocols that are used in Internet.

### **Client-Server Networks**

Client/server describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request. A. The client-server model can be used on the Internet as well as local area networks (LANs). In both these cases, computers may interact with each other and share resources between them.

### **Peer-to-Peer Networks**

Another way of using computers in a LAN is to make each of them act as both a server and a client. In this arrangement each node has access to the resources of other nodes. That is users can have access to the hard disks and printers attached to other computers.

### **Value-Added Networks**

Owners of many wide area networks offer additional services to network users (for a fee). These services may include access to different types of databases, e-mail, games, etc. WANs that add such services to the existing capabilities are known as ***value-added networks (VANs)***. In many countries, governments support VANs to provide service to the public.

The following components are needed for internet connection.

1. Personal Computer
2. Modem or ISDN – Modem (Modulation and Demodulation) is used to convert digital information into analog signals which carried by ordinary telephone line and also convert the analog signal into digital signal which send back to the computer. ISDN (Integrated Services Digital Network) is carries digital signal from one computer to another computer through special telephone wires.
3. Telephone connection - Get a telephone connection from telephone agents.
4. ISP (Internet Service Provider) – Purchase internet account package from ISP and install in your computer. It gives user name and password to enter into the internet.

### **How to enter into Internet?**

After configuring the internet along with the pc, you can see the Icon on the desk top with the ISP's name given by the user. By clicking that ISP's name Icon you will get window contains username and password. Dial then click the dial button and wait for some time. The username and password verified and if they are correct and then internet connectivity will be achieved. Then you can open the browser and start your browsing in the internet.

### **Browser**

A web browser is a software application program that allow user to access display and interact with text, images, videos, music and other information navigate the World Wide Web. The process of accessing the web site through the software is called browsing.

### **How to browse the website**

After achieving internet connectivity double click the Internet Explore to open it.



If you want to browse a web site, that website's address has to be typed in the address box. (Uniform Resource Locator). Eg., [www.annamalaiuniversity.ac.in](http://www.annamalaiuniversity.ac.in)

After typing the address then press the enter key, in few second your will see your specified web site.

## **Network Applications**

Networks allow many users to share a common pathway and communicate with each other. More and more people are having direct access to computers at their desks and therefore the use of networks is growing at a fast rate. Numerous public and private networks now offer a variety of services to organisations and individuals. The most common types of network applications are:

- Bulletin board service (BBS)
- Information services
- Telecommuting
- Teleconferencing
- Workgroup computing
- Electronic funds transfer (EFT)
- Electronic data interchange (EDI)
- Electronic commerce

A **bulletin board service (BBS)** is an on-line service provided through the network. When users join a BBS, they take part in group discussions around the world by reading messages left by other users, and then contribute their own points. The purpose is either social or business. It also acts as a source of professional contacts.

Many companies provide **information services** to which users can subscribe. By accessing an information service, a user can tap into a variety of

on-line services, such as reservation systems, reviews, commodity prices, stock prices, articles and reports.

**Telecommuting** and **teleconferencing** enable working executives to work at home and thus reduce travel time and improve productivity.

**Workgroup computing** is made possible with groupware features that support electronic mail, voice mail, public calendars, meeting schedules, electronic voting and document sharing.

**Electronic funds transfer** uses a computer network to handle financial transactions between banks, buyers, and sellers.

**Electronic data interchange** allows the exchange of business documents electronically between two or more organisations.

**Electronic commerce** refers to the conduct of trading using computer networks. It may include electronic mail, electronic funds transfer, and electronic data interchange.

## **Internetworking (IP)**

The switched data sub networks more often need to be interconnected allowing users to communicate not just within one sub network but across several sub networks. The extended network so formed is often called an internetwork. Mere electrical connection of two sub networks is not sufficient because the sub networks differ in so many ways. Their technologies, topologies, protocols and their services all are different. Therefore some special intermediary devices are required. These devices sort out the differences and enable the users on one sub network to communicate with users on another sub network.

## **WWW (World Wide Web)**

The *World Wide Web* is a distributed system of interlinked web pages which are stored in different machines called web servers. It is a client-server application system which transfers text, graphics and sound files through the Hyper Text Transfer Protocol (HTTP). These files called pages or web pages contain information or a piece of pages and links to resources throughout the Internet. The collection of web pages is known as a website. These files represent text documents, pictures, video, sound, programs, interactive environment and other useful details.

## **HTML**

### **What is HTML ?**

To publish information for global distribution, one needs a universally understood language, a kind of publishing mother tongue that all computers may potentially understand. The publishing language used by the www is HTML.

HTML gives authors the means to:

- Publish online documents with headings, text, tables, lists, photos, etc.
- Retrieve online information via hypertext links, at the click of a button.
- Design forms for conducting transactions with remote services, for use in searching for information, making reservations, ordering products, etc.
- Include spreadsheets, video clips, sound clips, and other applications directly in their documents.

HTML files are nothing more than simple text files, so to start writing in HTML, you need nothing more than a simple text editor. Notepad is a common text editor (on Windows this is usually found under the Programs > Accessories menu). Type html codes and save the file as "myfirstpage.html".

To look at HTML files, they don't even need to be on the web. Open a web browser such as Firefox or Internet Explorer and in the address bar, where you

usually type web addresses, type in the location of the file you just saved (for example, "c:\html\myfirstpage.html") and hit return. Alternatively, go to the File menu of the browser, select Open, and browse for the file.

### **Structure of a HTML page**

```
<HTML>

  <HEAD>

    <TITLE> name of the document </TITLE>

  </HEAD>

  <BODY>

    .....page content .....

    .....page content.....

    .....page content.....

  </BODY>

</HTML>
```

### **HTML tags**

#### 1. <HTML> tag

The first page structure in every HTML page is the <HTML> tag. It indicates that the content of this file is in the HTML language. All the text and HTML comments in a HTML page should go within the beginning and ending HTML tags.

#### 2. <HEAD> tag

The <HEAD> tag specifies the line within the beginning and ending points of the tag are the prologue to the rest of the file. Generally, only a few tags go into the <HEAD> portion of the page.

### 3. <BODY>..</BODY> tag

The remainder of the HTML page, including all the text and other content is enclosed within a <BODY> tag.

### 4. <TITLE>...</TITLE> tag

The <TITLE> tag is used to show title of document in the title bar of the web browser.

### 5. <H> tag

The header tag <H> is used to display the text in different font size. It has six types

<H1>...</H1> - Largest heading size. ex. **Heading 1**

<H2>...</H2> - Large heading size. ex. **Heading 2**

<H3>...</H3> - Medium-big heading size. ex. **Heading 3**

<H4>...</H4> - Medium-small heading size. ex. **Heading 4**

<H5>...</H5> - Small heading size. ex. **Heading 5**

<H6>...</H6> - Smalles heading size. ex. **Heading 6**

### 6. <P>...</P> tag

The Paragraph tag <P> is used display the in paragraph format and also align the text in left, right, center and Justify format.

### 7. <OL>...</OL> tag

This tag is used to show list of items in ordered format. Each item is covered with <LI>..</LI> tag.

Example:

```
<OL>
```

```
<LI> red </LI>
```

```
<LI> green </LI>
<LI> blue </LI>
</OL>
```

Output

```
1.red
2.blue
3.green
```

7. <UL>...</UL> tag

This tag is used to show list of items in unordered format. Each item is covered with <LI>..</LI> tag.

Example:

```
<UL>
<LI> red </LI>
<LI> green </LI>
<LI> blue </LI>
</UL>
```

Output:

- red
- green
- blue

8. <B>...</B> tag

This is used to display text in bold face.

<B> bold</B>

Output:

**bold**

9. <I>...</I> tag

This is used to display text in Italic style.

<I> Italic </I>

Output:

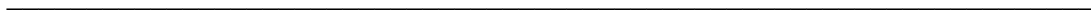
*Italic*

10. <HR> tag

This used to draw single line. The <HR> is not need to closing tag </HR>

<HR>

Output:



11. <BR> tag

This is used to break line in a paragraph.

12. <IMG> tag

This is used to include the image to html page with different size.

Example : <IMG src="c:\bird.jpg">

13. <A> ... </A> tag

This is used to create a hyper link for another page or image or file etc. The linked words are displayed in blue color with underlined. User click linking word then we can move to the linked page.

Example: `<A href="c:\main.html"> main </A>`

Output : [main](#)

14. `<Table>... </Table>` tag

This tag is used to display items in tabular format with different color.

15. `<Tr>...</Tr>` tag

It is used to create new row in a table. It is used inside the `<Table>` tag.

16. `<Td>...</Td>` tag

It is used to display individual data item in a single row. It is used inside the `<Tr>` tag.

Ex :

```
<table border=1>
  <tr>
    <td>name</td> <td> marks(100) </td>
  </tr>
  <tr>
    <td>Mani</td> <td> 95</td>
  </tr>
  <tr>
    <td>sureh</td> <td> 85</td>
  </tr>
```



</table>

Output :

| name  | marks(100) |
|-------|------------|
| Mani  | 95         |
| sureh | 85         |

### Simple HTML page

```
<HTML>
```

```
  <HEAD>
```

```
    <TITLE> MY FIRST WEB PAGE </TITLE>
```

```
  </HEAD>
```

```
  <BODY>
```

```
    <UL>
```

```
      <L1> SOFTWARE
```

```
    <OL>
```

```
      <L1> COMPUTER CONCEPTS
```

```
      <L1> MS-WORD
```

```
      <L1> MS -EXCEL
```

```
      <L1> MS-POWERPOINT
```

```
      <L1> MS-ACCESS
```

```
    </OL>
```

```
    <L1> HARDWARE
```

```
<OL>

<LI> CPU

<LI> INPUT DEVICE

<LI> OUTPUT DEVICE

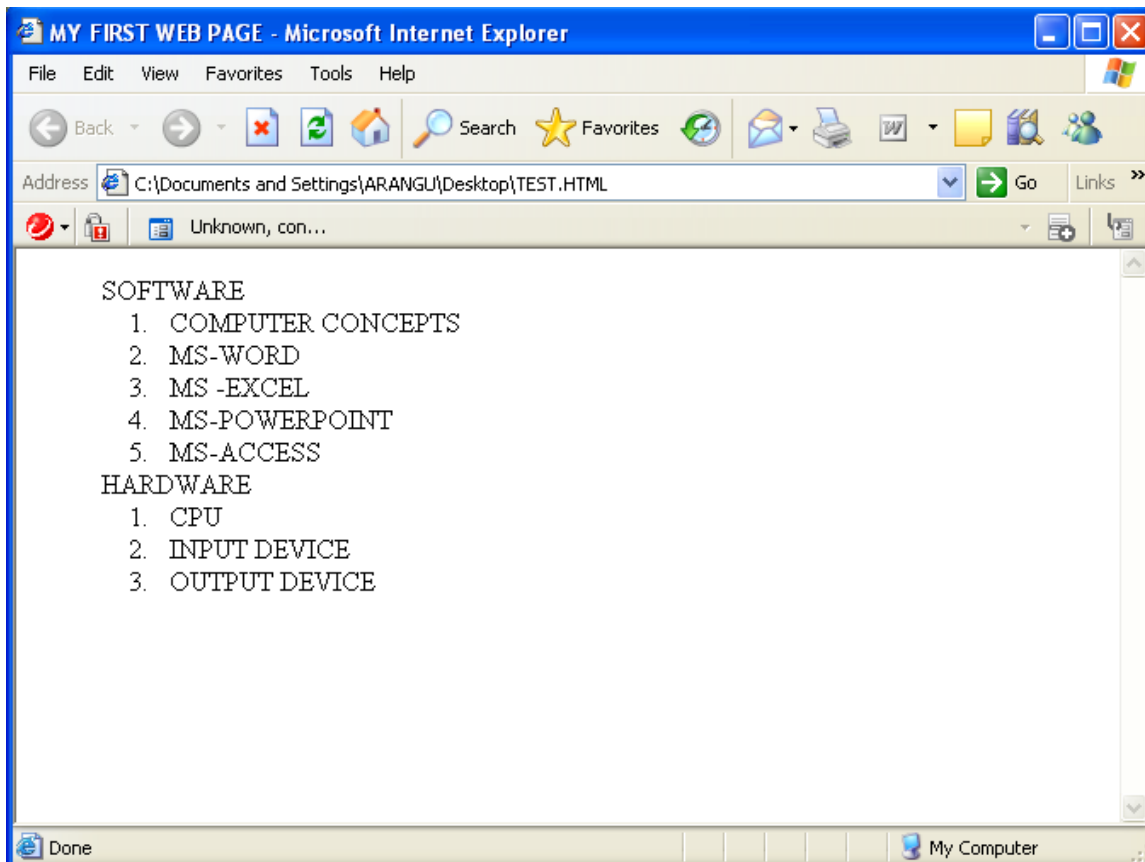
</OL>

</UL>

</BODY>

</HTML>
```

The out put for the above HTML program is as follows



## **MS-WORD**

Microsoft word shortly known as MS Word is one of the most popular windows word processing program because of its power and ease of use to efficiently create, modify and manage many kinds of documents for professional and personal use. It enables you to create documents such as letters, labels, drawings, tables and envelops. This package also allows you to format your document using the available tools such as automatic formatting, paragraph alignment, borders and well-written documents. Through its evolution it has come to include desktop publishing (text, boxes and graphics), web page editing, a browser, embedded applications such as spreadsheets, power point slides and macro programming using a customized version of Microsoft's Visual Basic programming language.

### **Menu Options**

- ✓ File menu is used to type a new document, opening a document, saving a document, printing a document, etc.
- ✓ Edit menu is used for Cut, Copy, Paste, clear, find and replace, creating book marks, etc.
- ✓ Insert menu is used for inserting page breaks, date/time, symbols, document, pictures, etc.
- ✓ Format menu is used for formatting text such as Font, Paragraph setting, tab setting s, changing case, bullets and numbering.
- ✓ Tools menu option is used for spelling check, grammar, word count, mail merging, recording macros, etc
- ✓ Table menu is used for manipulating tables such as inserting and deleting rows and columns, sorting rows, applying formulas in tables etc.
- ✓ New (Ctrl+N) is used to create a new document. Open (Ctrl+O) is used to open an existing document. Save (Ctrl+S) is used to save the current document. Save As to save current document in another name. Close

option close the current document. Save All option saves the entire opened document.

## **M.S. Excel**

Microsoft Excel shortly known as MS Excel is one of the most popular windows spreadsheet program because of its power and ease of use to organize data about transactions for a person to examine. It provides a grid of cell for data entry and a range of mathematics, financial and statistical functions to manipulate the data (such as sum, average and maximum values of data in columns or rows). This allows the creation of business spreadsheets for sales, staff or product information with the associated monthly costs, sales, wages and profit etc. Excel may also be used for data collection and simple statistical analysis in research.

## **FEATURES OF SPREADSHEETS**

There are a number of features that are available in Excel to make your task easier. Some of the main features are:

1. AutoSum - helps you to add the contents of a cluster of adjacent cells.
2. List AutoFill - automatically extends cell formatting when a new item is added to the end of a list.
3. AutoFill - allows you to quickly fill cells with repetitive or sequential data such as chronological dates or numbers, and repeated text. AutoFill can also be used to copy functions. You can also alter text and numbers with this feature.
4. AutoShapes toolbar will allow you to draw a number of geometrical shapes, arrows, flowchart elements, stars and more. With these shapes you can draw your own graphs.
5. Wizard - guides you to work effectively while you work by displaying various helpful tips and techniques based on what you are doing.
6. Drag and Drop - it will help you to reposition the data and text by simply dragging the data with the help of mouse.

7. Charts - it will help you in presenting a graphical representation of your data in the form of Pie, Bar, Line charts and more.

8. PivotTable - it flips and sums data in seconds and allows you to perform data analysis and generating reports like periodic financial statements, statistical reports, etc. You can also analyse complex data relationships graphically.

9. Shortcut Menus - the commands that are appropriate to the task that you are doing will appear by clicking the right mouse button.

### **Functions are classified into several functions such as**

1. Math & Trig function
2. Text function
3. Logical function
4. Statistics function
5. Lookup and reference function
6. Date & Time function
7. Financial function
8. Information function
9. Data base function

### **Statistical functions**

Count() - count number of numeric values in a list. Other type data will be included (1 to 30 arguments)

CountA() - count the nonempty cells in a range

Min() - find the minimum value in a range

Max() - find the maximum value in a range

Var() - find variance of the range

Stdev() - find standard deviation of the range

Mode() - find the most common value in a range

Median() - find the median of the range

### **Financial Functions**

1. DDB() - calculate depreciation using double declining method
2. FV() - calculate future value of an investment
3. PMT() - calculate periodic payment value
4. PV() - calculate present value
5. SLN() - calculate depreciation using straight line method
6. SYD() - calculate depreciation using sum of years

### **MS-PowerPoint**

Power point is presentation software program. Power point uses a graphical approach to presentation in the form of slide shows that accompany the oral delivery of the topic.

This program is widely used in business and classrooms and in an effective tool when used for training purposes.

### **Powerpoint Facility**

1. Powerpoint is one of the simplest computer programs to learn
2. It is easy and good program used world wide for presentations
3. It is easy to customize presentations with company logo.
4. Many more templates are also available, the user can utilize the templates.
5. In addition to an on screen slide show
6. Power point has printing option.

## **Presentation**

A presentation is a collection of data and information that is to be delivered to a specific audience.

A power point presentation is a collection of electronic slides that can have text, picture, tables, sound and video. This collection can run automatically or can be controlled by a presenter.

## **Function of power point**

It is commonly used in a variety of ways by business, education, and government employees to provide a computerized, "Slide-show" for enhance the presentation. Power point might be employed to direct attention to an outline of the presentation or display graphs and pictures or to focus the audience on key points.

## **Features of Microsoft power point:**

1. Start with a bulid in layout
2. Use slide master view to update design consistently
3. Use some one else's presentation as a starting point
4. Rearrange slides for effectiveness
5. Follow the guides
6. Set slide sizes
7. Resize multiple objects
8. Clean up tables quickly
9. Learn to use smart art
10. Try a theme variance

# **BFSC-209 Information and Communication Technology**

## **Unit –V**

**Syllabus** - Audio visual aids - definition, advantages, classification and choice of A.V aids; cone of experience and criteria for selection and evaluation of A.V aids; video conferencing. Communication process, Berlo s model, feedback and barriers to communication

### **Audio Visual Aids - Definition**

Audio-Visual aids can also be defined as an aid which supplements the teachers teaching effectiveness and facilitates the learners to learn with greater understanding.

Audio visual aids are the instructional devices. In which, by audio aids the learners can only hear the information, by visual aids the learners can only see the information, by audio visual aids the information can be heard and as well as seen.

### **Objectives of Teaching Aids**

1. To enhance teachers skills which help to make teaching-learning process effective
2. Make learners active in the classroom
3. Communicate them according to their capabilities
4. Develop lesson plan and build interest
5. To make students good observer
6. Develop easy and understandable learning material
7. Follow child cornered learning process
8. Involve intimation in objectives
9. To create interest in different groups
10. To make teaching process more effective



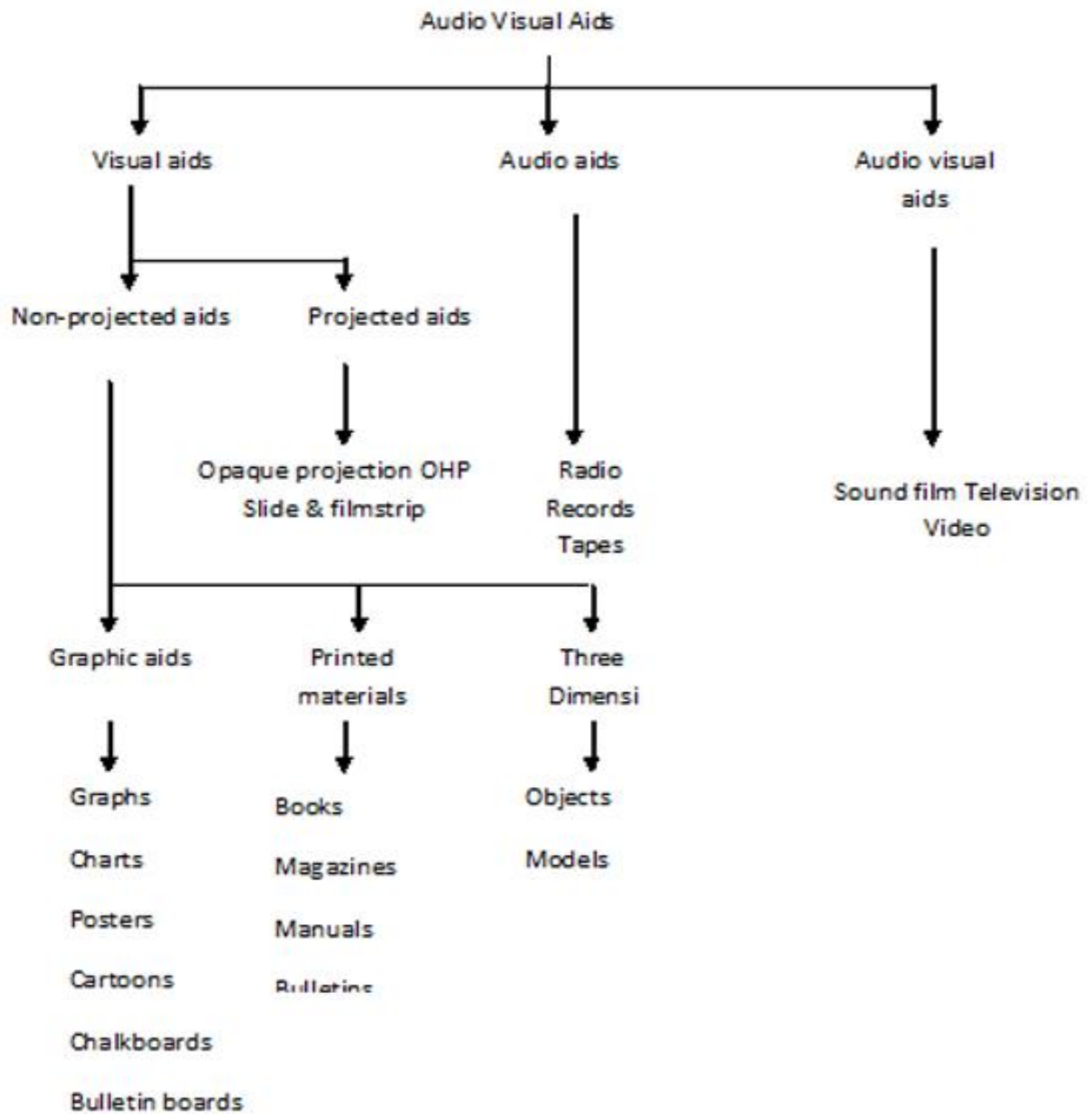
## Advantages of Audio-Visual Aids

1. Capture audience attention and arouse their interest
2. Highlight main points of the message clearly
3. The possibility of misinterpreting concepts is reduced
4. Structure the learning process more effectively
5. Messages perceived with several senses are understood and retained better
6. Help to reach more people irrespective of their level of literacy and language
7. Speed up the process of learning
8. can adapt the speed of presentation to the reactions of the audience
9. Save time of teacher and learner
10. Its helps to make learning process more effective and conceptual.
11. Its helps to grab the attention of students
12. It builds interest and motivation teaching students learning process
13. It enhance the energy level of teaching and students
14. It is even better for over burden classrooms
15. It provides students a realistic approach and experience

## Classification

It can be classified simply on the bases of sensory experience. Because human beings derive their experiences mainly through direct sensory contact. Keeping this in view, it can be classified in to three main groups:

1. **Audio Aids** examples are Radio, Tape-recorder, Gramophone, Lingua phone, Audio cassette player, Language laboratory
2. **Visual Aids** examples are Chart, Black and white board, Maps, Pictures, Models, Text-books, Slide projector, Transparency, Flash-cards, Print materials etc.
3. **Audiovisual Aids** examples are LCD project, Film projector, TV, Computer, VCD player, Virtual Classroom, Multimedia etc.



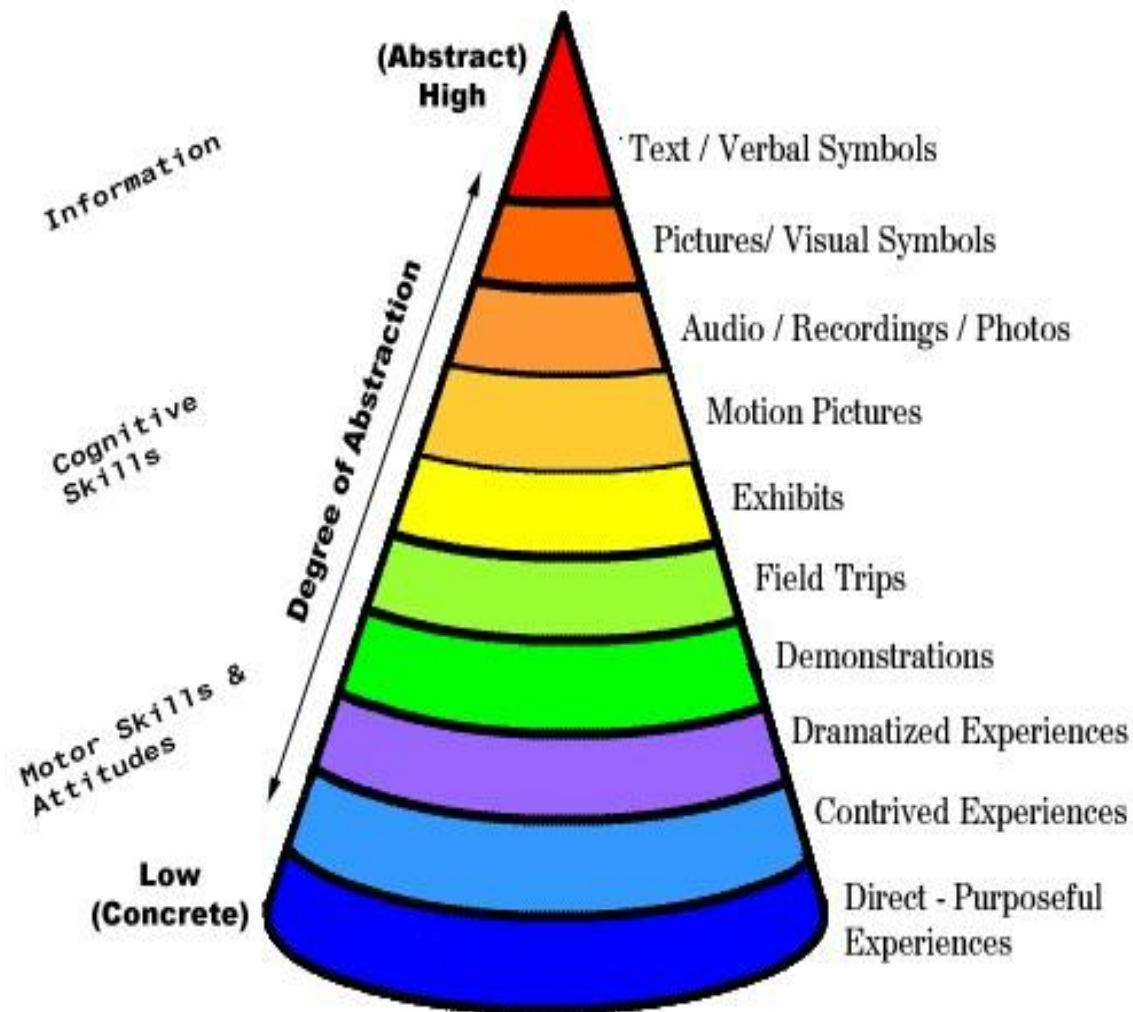
## **Who can take benefit from Visual Aids (choice of A.V aids)**

Though every children can take benefit while using visual aids for learning. But it is more helpful for those students:

- Having Language Disorder
- Autism Spectrum Disorder
- Down Syndrome
- Those who have Learning Disabilities
- Student who have English as a secondary Language
- Those having Oppositional Defiant Disorder
- Personality Development Delay
- Have the problem of Hearing Impairment
- Have the symptoms of Attention Deficit Hyperactivity Disorder ADHD

## Cone of Experience

The *Cone of Experience* devised by Edgar Dale represented here is not meant to be a flawless picture. It merely represents the inter-relationship of the various types of audio-visual materials. The bands of the cone are not rigid, inflexible divisions, as there are considerable overlapping and blending. It can be regarded as a visual metaphor in which the various audio-visual materials appear in order of increasing abstraction as one proceeds from direct experience.



Graphic courtesy of Edward L. Counts, Jr.

|                  |                                           |                                                                                                                                                                                 |
|------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Abstract</b>  | <b>Verbal symbols</b>                     | <b>Designations which have no resemblance to ideas or objects for which they stand. For example, the symbol H<sub>2</sub>S does not smell like the materials it symbolises.</b> |
|                  | <b>Visual symbols</b>                     | <b>Graphs, maps, charts, and sign. Visual symbols are abstract representation but can clarify speech and understanding.</b>                                                     |
| <b>Observing</b> | <b>Radio, recordings, still pictures</b>  | <b>Generally considered as one dimensional aids but with the advantage of magnification.</b>                                                                                    |
|                  | <b>Motion pictures, television, video</b> | <b>May include sound, colour, etc. It can compress time and space. However, it is seen by a passive spectator, without the senses of touch, smell or feeling.</b>               |
|                  | <b>Exhibits</b>                           | <b>Displays, bulletin boards and may even include a motion picture or demonstration. A true exhibit is something one sees as a spectator.</b>                                   |
|                  | <b>Field trips</b>                        | <b>For example, visits to an aquaculture farm. It the participants discuss matters with the farm operator, then</b>                                                             |

|              |                                      |                                                                                                                                                                        |
|--------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                                      | <b>the trip gains in directness.</b>                                                                                                                                   |
|              | <b>Demonstrations</b>                | <b>For example, extension workers demonstrating the operation of a type of fishing gear. The participants are able to see how things are done.</b>                     |
| <b>Doing</b> | <b>Dramatic participation</b>        | <b>Getting as close as possible to things which cannot be experienced at first hand.</b>                                                                               |
|              | <b>Contrived experience</b>          | <b>A simplified model or a cutaway showing how an intricate mechanism works. A contrived experience is editing of reality which makes the reality easier to grasp.</b> |
|              | <b>Direct, purposeful experience</b> | <b>Performing a laboratory experiment. It is learning by direct participation with responsibility for the outcome.</b>                                                 |

### **Factors influencing the selection of audio visual aids**

1. Audio-visual aids are used singly or in combination, taking the following factors into consideration.
2. The teaching objective - the type of behaviour change you want to bring about gaining information or changing attitudes, or learning some skill.

3. The nature of subject matter being taught.
4. The nature of audience - age level, educational level, interest, experience, knowledge of the subject, intelligence, etc.
5. The size of audience - for instance flash cards can be used for a small audience only; motion picture for larger audience.
6. Relative cost of the various aids. Effective aids need not necessarily be expensive.
7. The teacher - (i) the extension worker's familiarity with and skill in using the several aids and (ii) his originality and skill in selection, preparation and use of aids.
8. The availability - an effective extension worker makes use of indigenous materials, when the teaching aid he would like to use, is not available.

### **Disadvantage of Audio-Visual Aids**

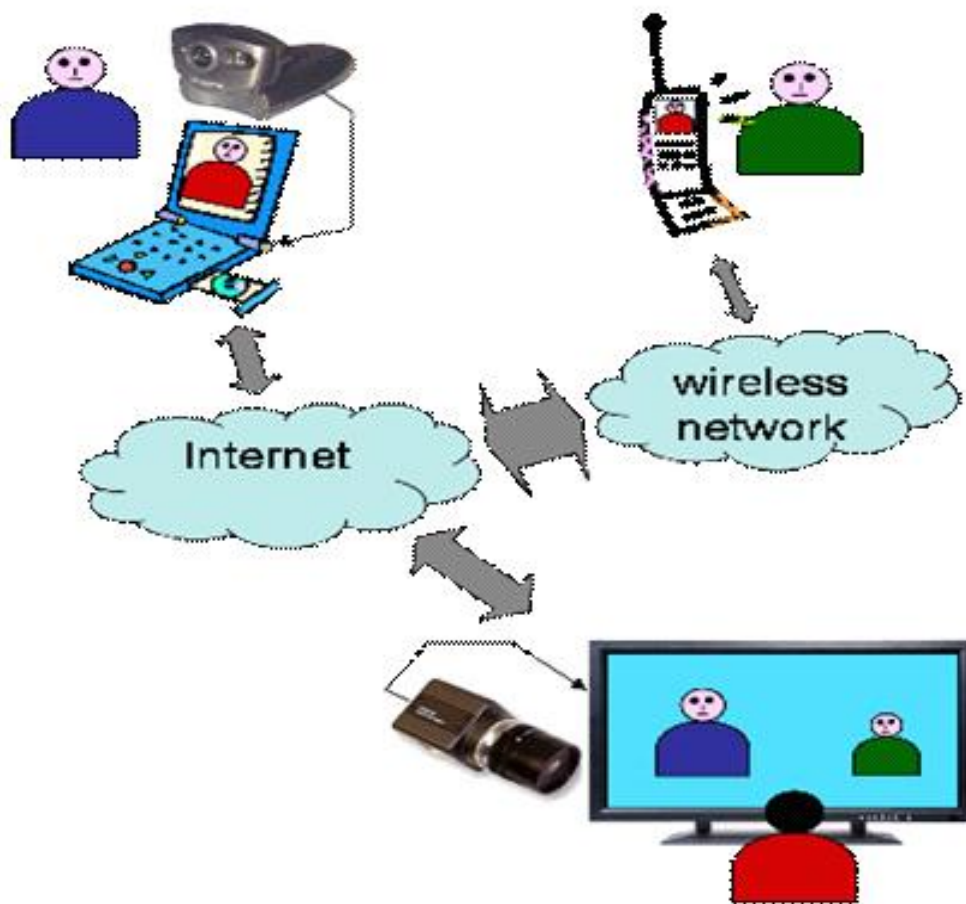
1. Learners may sometimes form mistaken or distorted impressions, unless audio-visual are supplemented with required explanations.
2. Temptation for the extension worker to narrow down his teaching to only a few ideas, not giving the complete picture of a subject.
3. Some extension workers acquire the mistaken idea that they have little to do when audio-visual are used.
4. Possible risk of *spectators'* instead of the attitude of thoughtful enquiry.
5. Technical Problems, Students Distractions, Expensive, Time Consuming, Need Speed, Convenience.

### **Video Conferencing**

Conducting a conference between two or more participants at different sites by using computer networks to transmit audio and video data . For example, a *point-to-point* (two-person) video conferencing system works much

like a video telephone. Each participant has a video camera, microphone, and speakers mounted on his or her computer. As the two participants speak to one another, their voices are carried over the network and delivered to the other's speakers and whatever images appear in front of the video camera appear in a window on the other participant's monitor .

Multipoint videoconferencing allows three or more participants to sit in a virtual conference room and communicate as if they were sitting right next to each other. Nowadays videoconferencing will be one of the fastest-growing segments of the computer industry for sharing information over computer networks throughout the world.

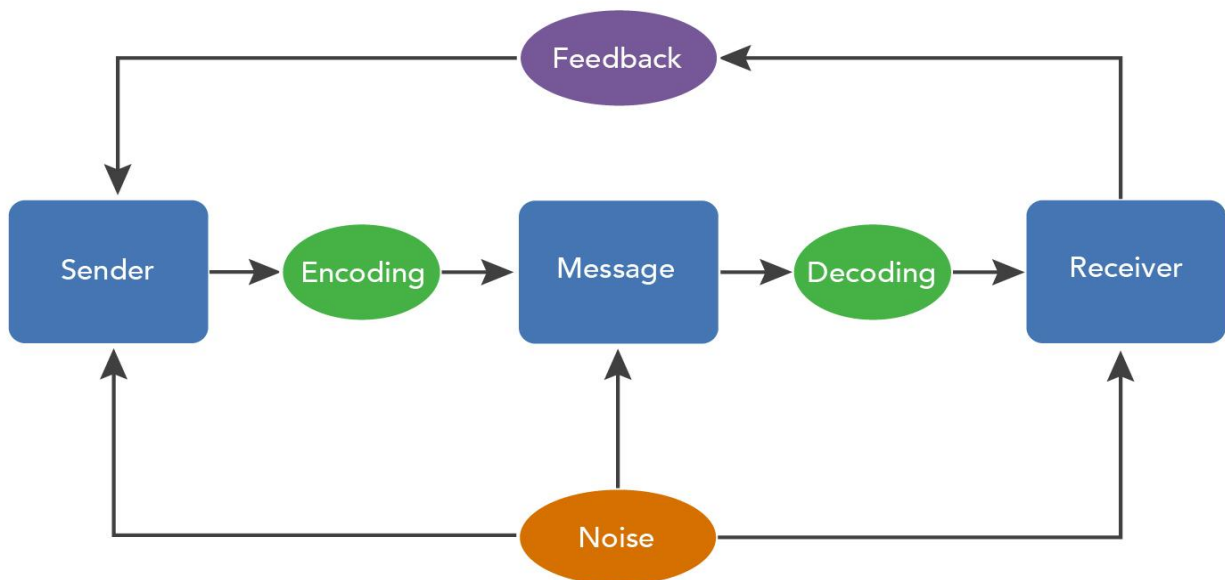




## Communication Process

The **communication process** is the steps we take in order to successfully **communicate**. Components of the **communication process** include a sender, encoding of a message, selecting of a channel of **communication**, receipt of the message by the receiver and decoding of the message. ... Noise is anything that hinders **communication**.

Basically, however, the process of communication is the same, whatever method is used. This basic process involves the following steps:

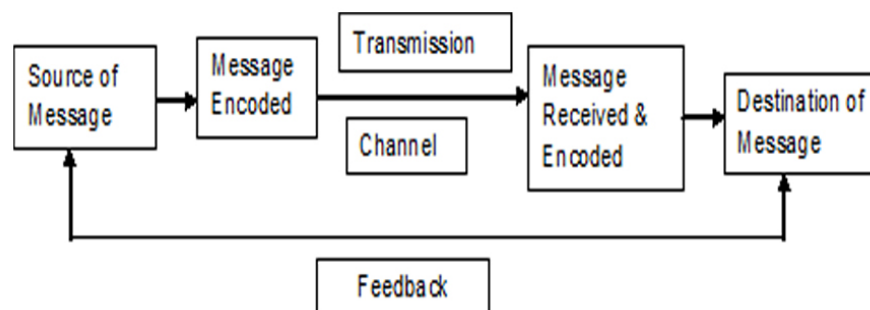


|   |           |                                                                                                                                                         |
|---|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | SENDER    | A person has an idea which he wants to communicate                                                                                                      |
| 2 | ENCODING  | he translates this idea in his mind into generally accepted symbols (words, gestures, pictures, etc.)                                                   |
| 3 | MESSAGE   | He speaks the words, makes the gestures or shows the picture, etc.                                                                                      |
| 4 | RECEPTION | The communication partner hears the words, sees the gestures or the picture, etc.                                                                       |
| 5 | DECODING  | The partner retranslates the symbols he has received into ideas in his own mind                                                                         |
| 6 | RECEIVER  | The successful outcome of the process results when a new idea is formed in the audience's mind which is identical with the idea that was first encoded. |

This model illustrates that a message (at the mental level), generally in the form of information, organised by a source or sender (the brain of an individual), is encoded and converted into a form (a thought verbalised by being turned into sound waves or words of script). The message then passes through a transmitter (print, film, television) via a suitable channel (air, wire, paper, light) to the person's senses (eyes, ears, nerve endings) where the message is decoded (within the nervous system, conversion into mental symbols) at the destination (brain of the receiver)

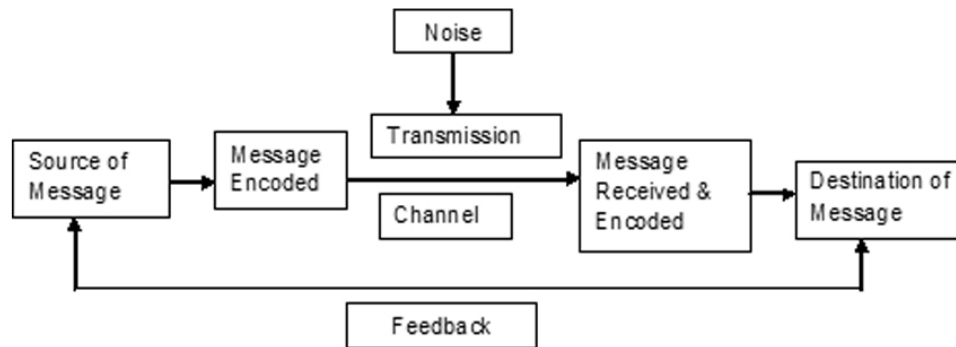
### Feedback

Effective communication depends upon the receiver being active. He reacts by answering, questioning, or performing, mentally or physically. There is then a response or return loop of this cycle, from receiver to sender. This is termed feedback.



Feedback enables the originator to correct omissions and errors in the transmitted message, or to improve the encoding and transmission process, or even to assist the recipient in decoding the message.

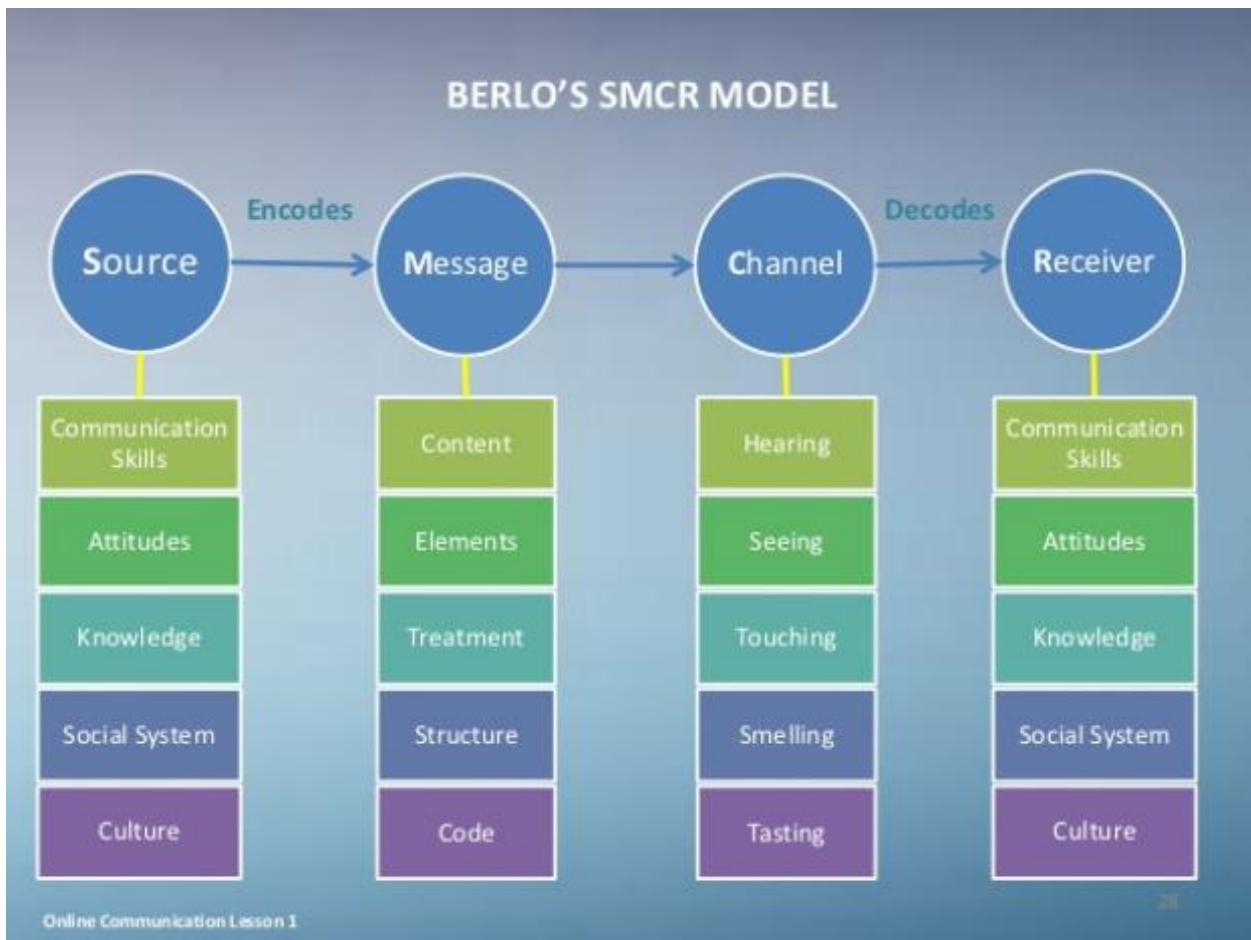
One additional element must be added to this communication process: Noise.



Noise is any disturbance that interferes with or interrupts or distorts the transmission of the message. The factor of noise can have a serious impact on the success or failure of communication. Static on a radio broadcast is a simple example of noise. A flashing light can be a distracting "noise" when a person is reading a book. Ambiguous or misleading material in a film can be deemed "noise". Noise can be created internally, within the receiver, to upset satisfactory communication: for example, lack of attention. Even conflicting past experience can be an inhibiting "noise" source. Recall the importance of an individual's background experience which will affect his perception. Noise clouds and masks of information transmitted in varying degrees must be recognised as obstacles to be overcome.

## Berlo model of communication

Berlo's model is of basic importance in developing other communication models and for identifying elements of communication. He identified essential elements and also other factors affecting them such as the five senses.



## Barriers of Communication

At every step of the process, things may go wrong. Here are some of the more common causes of communication failure.

### Barriers to Effective Communication



At the **CREATION STAGE**, an idea may be vague, or it may be too general and all-inclusive to be clearly formulated in the mind. Such an idea has little chance of being successfully communicated.

In **ENCODING**, a person may use symbols which are unclear, or ambiguous. Or they may be clear to him, but not to the recipient, because differences in culture or training may mean that they signify something else, sometimes even an opposite concept.

When **TRANSMITTING**, a person may not be very skilled, so that he mumbles or stammers or speaks too fast.

The **RECEPTION** too may be disturbed through outside interferences, noise, or points of interest which are unconnected with the matter at hand and these factors steal the partner's attention away from the message.

In **DECODING**, a great deal depends on what each symbol means to each individual person, on his background and his expectations.

Finally, at the **FRUITION**, stage, the idea that is formed in the audience's mind may be different from the idea that was encoded in the first place.

When one or more of these things happen, there is a misunderstanding, the cause of a great deal of trouble and friction among human beings. It is important, therefore, that people whose job it is to communicate to others, should understand the process, and realise the dangers, so as to be able to avoid them as far as possible.

\*\*\*\*\* BEST WISHES \*\*\*\*\*