

XI-Introduction to IT

Introduction to Computers:

A computer is a electronic device that is designed and organized to automatically accept , store , process and produce results under the direction of stored

Data are facts and information that are gathered and entered into the computer. Information can be in the form of text, numbers, symbols, sound pictures graphics etc. organized in a meaning way.

A software is a collection of programs to perform some complicated task and a program is a set of logical sequential instructions which tells the computer to to solve some problem.

Architecture Of Computer:

System:

A system is a group of integrated parts that have common purpose of achieving some objectives. Since a computer is made up of integrated components that work together for the execution of a certain task it is called a system. All data are processed by a collection of electronic circuits and other devices that make up the computer system. The physical equipments and components, which you can see, touch and feel in the computer system, are called hardware. Like stereo systems, computer systems are built from many components. Although specific systems differ, certain basic components or building blocks exist in all computer systems. These components are the input unit, output unit, central processing unit and the storage unit.

Input Unit:

All instructions or data must enter the computer system before any processing can be done on the data. This task is done by the input unit that links the external environment with the computer system. Data are entered into the computer system by means of an input device. The keyboard is one of the most common input devices. Other common ones include readers of punched cards, paper type and magnetic type, magnetic disk, light pen, optical scanners, MICR (Magnetic Ink Character Recognition), OCR (Optical Character Recognition) and the mouse.

Output:-

When a program is executed and the results computed, those results must be available in a human readable form. The computer system needs an output device to communicate the processed information to the user. The output device translates processed data from a machine coded form to a form that can be read and used by people. The most common types of output devices are the monitor, which resembles a television screen, and the printer.

Central Processing Unit:

The central processing unit (CPU), sometimes referred to as the 'brain' of the system, is the part of the computer that contains the electronic circuitry that actually processes the data. The CPU also controls the flow of data through the system, directing the data to enter the system placing data in memory and directing the output of information. It contains the processor, registers, a control unit, which controls the execution of a program, a clock, and the arithmetic logic unit, which performs mathematical operations and comparisons. A CPU that is contained on a single chip is called a Microprocessor.

Storage Unit:

The data and instructions entered into the computer system through input units have to be stored inside the computer before the actual processing starts. Similarly, the results produced after processing must be stored to be passed onto the output unit. The storage unit is designed to cater to these needs. It provides space for storing the data, instructions, intermediate and final results.

Data storage :

Memory Systems (Bits & Bytes) :

The function of the memory is to store information/data. The internal memory is also called as main memory

The unit of the memory is bits. The data gets stored in the form of binary language which is in the form of 0's and 1's . 1 Bit can hold either 0 or 1 but not both. There are 2 types of memory unit i.e. main memory, and secondary memory.

The main memory unit is used to store the program, the data and the results. With the capacity of the memory ,it holds the program and data totally or partially.

The following table shows you the storage of data in the memory.

1 bit = smallest unit of storage

8 bits = 1 byte

1024bytes=1KB(Kilo Bytes)

1024KB=1MB(Mega Bytes)

1024MB=1GB(Giga Bytes)

Memory Organization:

Memory is a generic term used to describe any data storage area of a computer. A memory is made up of a large number of cells with each cell capable of storing one bit. Memory can be broadly divided into two types- Primary memory which in most cases requires a power source to retain data, and Secondary memory which does not require any power source once the write operation is complete.

The word storage is descriptive of a device or a medium that can accept data, hold it, and deliver it on

demand at a later time. Storage may be classified as Primary Storage and secondary.

Primary Storage:

The primary storage of a computer is electronic memory, made up of semiconductor chips.

Primary memory is classified as RAM and ROM.

RAM : Random Access Memory (RAM) is a memory into which the user can enter information and instructions (write) and from which the user call up data (read).

ROM : A ROM Is a storage memory inside the computer that cannot be amended or erased by the processor. ROM is used to hold static information necessary for the computer such as the Basic I/O System (BIOS).

Reading from a ROM should be non-destructive. The memory should also be non-volatile.

An important application of a ROM is to store tables which do not change. Another application of ROM is for storing short programs for special applications.

PROM : For more specialized uses where a user may like to store his own special functions or programs, it is preferable to fabricate a ROM on which a user can write these. Such ROMs are available and are called Programmable ROM (PROM). Programming is normally done using special writing circuits .In such a case the time taken to write information is long but the read-time will be relatively small. PROM is not a flexible memory as the information in it cannot be altered.

EPROM : There are applications where one may like to store a program in a ROM which would normally not change but under some unforeseen conditions one may like to alter it. Erasable and reprogrammable ROMs have been fabricated to meet this requirement. Information in such a ROM is erased by shining strong ultra-violet light through a window. After the ROM is exposed to ultra violet light all bits are erased and become 0. The ROM may then be reprogrammed. Such a PROM is known as EPROM (Erasable Programmable ROM) . In another scheme electrical pulses are used instead of ultra-violet light to erase a PROM.

EEPROM : In another scheme electrical pulses are used instead of ultra-violet light to erase a PROM. Such a ROM is known as Electrically Erasable Programmable Read Only Memory (EEPROM).

The following diagram shows the classification of RAM.



Secondary Storage:

The secondary capacity of primary storage is not sufficient to storage large volume of data. As a result additional memory called the auxiliary memory or secondary storage is used with most computer systems. Secondary storage is characterized by low cost per bit stored , but it generally has an operating speed far slower than that of primary storage.

Hard Disk :

An Electro Mechanical device that performs read/write operations to a hard disk. The disc drive has at least one read / write head which access and, if necessary updates data file on disk. The disk drive rotates the platter(s) of the disk at about 3600 revolutions per minute, ensuring that all areas of the disk appear under the read / write head at very frequent intervals.

Floppy Disk :

An Electro - Mechanical device that performs read / write operations to a floppy disk. The disc drive has a read / write head which accesses and, if necessary updates data files on disk. The disk drive rotates the internal magnetic media of the disk at about 360 revolutions per minute, ensuring that all areas of the disk appear under the read / write head at frequent intervals.

Floppy Disk: A Floppy Disk is a flexible plastic disk, coated with magnetic material and enclosed within a plastic sleeve. This is divided into concentric circles called tracks, which are further sub-divided into sectors. Data is stored in a floppy disk by encoding a bits of data along the tracks of diskette.

Compact Disk :

The disks used for data storage are known as Compact Disk Read Only Memory (CDROM). Information on

the CDROM is written by creating pits on the disk surface by shining a laser beams. The CDROM with pre-recorded information is read by a CDROM reader which uses a laser beam for reading. A CDROM is inserted in a CDROM drive, a motor at a speed of 360 revolution per minute rotates it A laser head moves in and out to the specific position. As the disk rotates , the head senses pits and land. Thus we can read data from the CDROM.

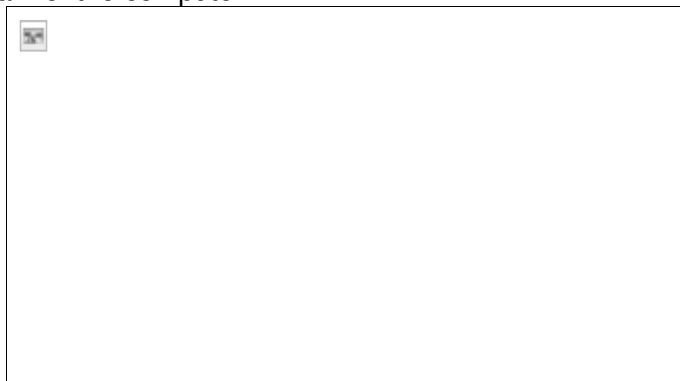
Anatomy of Computer :

Computer system is defined as an information-processing machine used to do arithmetic and logical manipulations with capacity to store data temporarily and permanently.

Every computer system has essentially four important units:

1) Input device 2) Central Processing unit 3) Memory and 4) Output device

The central processing unit itself has 3 units ,namely, control unit, arithmetic logic unit (ALU) and registers. Following is the block diagram of the computer.



Memory is the separate unit connected to the CPU by bus. In addition to the Memory unit computers also employ secondary storage devices for holding data or instructions on a permanent basis.

I/O Devices :

There are varieties of input and output devices that are used with computer systems for input output operations. Such devices surround the CPU and hence they are called Peripheral devices. The selection of these devices totally depends upon the application for which the computer system is used. These devices provide a good interface between the user and the computer system.

Input Devices :

Input devices are peripherals used to give the input data to the computer system for further processing.E.g Keyboard,Mouse,Scanners,Light Pen,etc.

Keyboard :

It is an input device used to input the information to the computer. Normal IBM standard key-board allows the alphanumeric set (A to Z and 0 to 9) to be entered, together with special characters like \$,*,@ etc.,The 4 types of keyboard switches are used.i.e.contact switch, magnetic read key switch, capacitate key switch and Half effect key switch.

Working of the Key-board :

Pressing a key causes a change in the amount of current flowing through a circuit associated specifically with that key.

The microprocessor of the keyboard (A microprocessor built into the keyboard , such as the intel 8048,genetates a number called Scan Code. There are two scan codes for each key one for when the key is pressed and the other for when it is released) built into detects the increase or decrease in current from the key that has been pressed and generates a scan code. It stores the scan code in the memory buffer (The memory buffer is a small set of memory cells that store the scan codes) where it can be read by the computers BIOS Basic Input Output System). The processor also sends a interrupt signal to the CPU which tells it to stop processing for a moment and divert its attention to the service requested.

The BIOS reads the scan code from the keyboard buffer and sends a signal that tells the keyboard it can delete the scan code from its buffer. The BIOS converts Scan codes into ASCII characters, then writes them into the queue buffer in the systems memory

The ASCII code is retrieved by the operating system of application software as soon as any current operation is finished.

Mouse :

The concept of a pointing device, something a computer user could move by hand, causing a corresponding movement on screen, led to the development of the mouse. *The "mouse" is an input device*, with one, two, or three buttons that allows you to point to and select items on the monitor screen. It is called a mouse because of its small size and long "tail". It is small enough to fit comfortably under the palm of your hand, and its "tail" is the cable that connects it to the PC. The mouse was developed as a means of operating in the GUI (Graphic User Interface) environment, dictated by the high level of physical activity that is required to work within such a system.

The mechanical mouse uses a rubber coated metal ball, located in the center of two different rollers. As you move a mechanical mouse by dragging it across a flat surface, a ball made of rubber or rubber over steel protruding from the underside of the mouse turns in the direction of the movement.

Signals are sent to the PC over the mouse's tail-like cable. Windows converts the number, combination, and frequency of signals from the two encoders into the distance, direction, and speed necessary to move the onscreen cursor.

Tapping either of the buttons atop the mouse also sends a signal to the PC, which passes the signal to the software. Based on how many times you click, and the position on the screen pointer at the time of the click, the software performs the task you want to accomplish.

As the ball rotates, it touches and turns two rollers mounted at a 90-degree angle to each other. One roller responds to back-and-forth movements of the mouse, which correspond to vertical movements on screen. The other roller senses sideways movements, which correspond to side-to-side movements onscreen.

Output Devices :

There are several devices by which the machine can communicate with operator. The quality of output is an area of research and development for the output devices. Printers, graph plotters, computer output microfilms (COM) are the output devices. Let us see in short about printers.

Printers :

The printer is the most commonly used output device. The output data is obtained on the paper through the printer. It is called *hardcopy*.

Printers are classified as of two types based on their working. Namely, Impact Printers and Non impact printers. Examples for *Impact printers* are *Dot matrix printers, Daisy wheel printers. Laser printers and Inkjet printers* are *nonimpact printers*.

Working of Impact Printers:

The PC sends the data to be printed and details that control the font, size, etc. to the impact printer in the form of 0s and 1s. These characters are stored in the printer's memory known as buffer till they are printed.

The processor takes these characters in the memory and are printed in the form of dots from right to left.

Dot Matrix Printer : The characters are produced by a series of pins arranged vertically which strike an inked ribbon against the paper. Each character is produced within a pre-defined matrix of dots. The speed may vary from 180 characters per second to 380 characters per min. It can also print pictures.

Working of Non Impact Printers :

The information is sent to the printer in the same way as in the case of an impact printer.

The main difference in printing is the way in which the data is printed. The non impact printer consists of spraying of ink from the cartridge which falls on the printing area and small dots are formed to make the character to be printed.

Inkjet : The print head of an inkjet printer forms characters by spraying a very fine jet of magnetically or electrically charged ink through a nozzle and four horizontal and vertical deflectors. The deflectors enable the printer to vary the direction of the ink spray. They work at speed of 1-2 pages per min.

Laser printer : It uses a laser beam to write characters on a rotating drum that is electronically charged. The drum generates a paper copy in a manner similar to a Xerox copier. The speed varies from 6 to 120 pages per min. They can also print graphics in different colors.

Monitors :

The visual display unit (VDU), also called Monitors are standard output devices. The information appears on the screen as and when it is entered from any of the input devices and after it is processed. The Cathode ray Tube and the display adapter determine features like the number of colours possible and the graphic capabilities. A maximum of 24 to 25 rows and 80 columns per row of information can be displayed in the Text mode. Apart from text, graphics and pictures can be displayed.

In the following manner the image is formed on the screen:

(Inside Parts of Monitor). In a computer system, the monitor is used as an Output device to view the data / information on the screen. This monitor is connected to the CPU via a data cable (used for receiving data from CPU) and a power cable (to make the monitor work). The CPU sends the data in the form of electrical signals to the monitor, which in turn converts them into Visual Images, to be seen on the screen.

The monitor consists of a Cathode Ray Tube (CRT), which acts as its main component. It consists of the following sub-parts - 1) Electron Gun 2) Magnetic Deflection Yoke 3) Shadow Mask 4) Phosphorus Screen. 1) *Electron Gun:* - Each electron gun shoots out a stream of electrons, one stream for each of the three primary colors.

2) *Magnetic Deflection Yoke:* - It uses electromagnetic fields to bend the path of the electrons. This helps in focusing and aiming the electron beams to all the parts of the screen.

3) *Shadow Mask:* - The beam is made to pass through holes in a metal plate called a shadow mask. This helps in keeping the electron beams focused when they reach the screen.

4) *Phosphorus Screen*: - On the inner side of the screen we have a coating of phosphor. This element has the property of phosphorescence (the element glows when struck by a beam of electrons) In the monitor three different phosphor materials are used - one each for Red, Blue and Green. The stronger the electron beam, more light the phosphor emits. If each Red, Blue and Green dot in an arrangement is struck by equally intense electron beams, the result is a dot of white light. To create different colors, the intensity of each of the three beams is varied. In this manner we get a dot of coloured light on the screen using three electron beams. To illuminate the whole screen, the same electron beams are used by deflecting them to all parts of the screen (dots on the screen). These dots are called Pixels (Picture Elements), which together make up an image / Picture on the screen. To illuminate all the Pixels on the screen, the electron beam is deflected to all parts of the screen. This is known as Raster Scanning.

Communications with Peripherals:

Scanner :

Scanner is an input device. Scanners are the eyes of your your personal computers.They allows a PC to convert a drawing or photograph into code that a graphics or desktop publishing program can use to both display the image on the screen and responce the image with a graphics printer.Or a scanner can let you convert printed type into editable text with the help of optical character recognition (OCR) software.

Scanners are mainly used for scanning pictures, images and photos form the magazine, newspaper, books etc.

There are 3 basic types of scanners, they are , *flat bed scanner, drum scanner and sheetfed scanner.*

Flat bed Scanner :

It consists of a light source; a charge coupled device array, a lens and one or more analog to digital converter to collect the optical information about the object to be scanned.

CIS (Contact Image Sensor) is a relatively advanced technology used for the flat bed scanners. It has a single chip that can handle many data processing functions. This type of technology gives good quality of scanning image.

Drum Scanner :

It is higher resolution scanner than that of the flat bed scanner. It uses photo multiplier tubes and other sensitive devices that can capture the high-resolution images.

This type of scanner can also capture shadow information that cannot be visible to the human eyes. The operating speed of such scanner is very low as compared to the flat bed scanner. This scanner is useful for scanning transparencies.

Sheetfed Scanner :

It is small in size and hence takes less desk space. In this type of scanner, tiny rubber wheels pull the paper over the scan head. During this type of operation there is a possibility of crooked scan. It is not possible to get the optimal scan using this type of printers.

Classification of Computers :

Computers can be classified into different types based on their memory size and processing capabilities. Supercomputers and mainframes support organization wide activities; midrange computers and workstations support group activities; and PCs and laptops support individual activities.

The computers are classified as follows:

- 1)Super Computers
- 2)Mainframes
- 3)Workstations
- 4)Microcomputers/ PCs
- 5)Laptop/Notebooks
- 6)Hand-Held
- 7)Pen-Based

SUPERCOMPUTERS - Super computers are the fastest and largest computers available today they are used in a wide variety of applications. E.g. the university of Oklahoma uses a supercomputer at the Pittsburgh Supercomputing Centre to forecast severe storms with its help, weather experts can now extend the forecasting period from 30 minutes to 4 or 5 hours. Supercomputers have large memories and high processing speeds they can process up to a billion instructions per second. They are used for processing very large files and performing large scale mathematical calculations.

MAINFRAME - A mainframe is a large general purpose computer with a large memory and excellent processing capabilities. Mainframes, which are frequently organization wide systems, take their name from the 'mainframe' that once housed the CPU. They are ideal for transaction processing , financial applications, payroll, investment analysis, weather forecasting, airline reservations, and other

applications that require massive computations and large scale processing. Unlike PCs which serve only one user, mainframes serve many users at the same time.

WORKSTATION - Workstations lie somewhere between midrange computers and PCs. They can be used by individuals or by groups. They are faster and more sophisticated than PCs and are equipped with a number of productivity tools that increase their efficiency.

MICROCOMPUTERS / PCs - Microcomputers also known as personal computers (PCs) are regarded by many as one of the greatest inventions in history. They have completely revolutionized the way American corporations do business. Although the memory size and processing capabilities of microcomputers are less than those mainframes and midrange computers, advances in hardware technology have made the PC a compact, powerful, and versatile machine.

LAPTOP / NOTEBOOKS - Laptops and Notebooks provide mobile computing technology. These are computers that are battery-operated and hence can be used any time and anywhere. Laptop computers are small enough to fit on the lap of a user notebook computers are even smaller. The primary differences between a laptop and a notebook are size and weight. Notebooks are smaller than laptops and weightless. However both are equipped with powerful microprocessors, graphic capabilities, adequate memory size, and mouse-driven input.

HAND - HELD COMPUTERS - Hand - held computers are even smaller than notebooks. They are primarily used to collect field data. For example, archaeologists at a dig site in Jordan use handheld computers to gather information about countries-old artifacts. The New York City transit police use hand-held computers to apprehend criminals. When a suspect is apprehended, a police officer uses a hand-held computer to do a background check on the individual. Each hand-held computer holds more than 1200 records and provides police officers with timely, and some times, and sometimes life-saving, information.

PEN - BASED COMPUTERS - Pen based computing refers to portable computers that use an electronic writing pad and a light-sensitive electronic pen, thus freeing users from the constraints of a keyboard. When the user writes on the pad, the writing is converted into digital input and stored in a file in the computer in the computer. pen based computing is becoming increasingly, popular because, most people are comfortable using a pen.

History of Computers :

The computer is a tool for shaping , managing , and enhancing our lives and our world. Today's laptops have come a long way from what computers were when they evolved.

Take a journey down memory lane to see how computers were at the dawn of information age.

First Generation Computers :

The first electronic computer was completed in 1946 by a team led by Professors Eckert and Mauchly at the University of Pennsylvania in U.S.A.. This computer called Electronic Numerical Integrator and Calculator (ENIAC) used high speed *vacuum tube* switching devices. It had a very small memory and was designed primarily to calculate the trajectories of missiles. The disadvantage of vacuum tube is , vacuum tube used filaments as a source of electrons, they had a limited life. Each tube consumed about half a watt power.

Computers typically used about 10,000 tubes, each with limited life.

Second Generation Computers :

A big revolution in electronics took place with the invention of *transistors* by Bardeen, Brattain and Shockley in 1947. Transistors made of *Germanium* semiconductor material were highly reliable compared to tubes since transistors had no filament to burn. They occupied less space and used only a tenth of the power required by tubes. Computer manufacturers thus changed over to transistors from tubes. The second generation computers emerged around 1955 with the use of transistors instead of vacuum tubes in computers. This generation lasted till 1965.

Third Generation Computers :

The third generation began in 1965 with germanium transistors being replaced by *Silicon transistors*.

Integrated circuits, circuits consisting of transistors, resistors and capacitors grown on a single chip of silicon eliminating wired interconnection between components, emerged. The effect of this was the emergence of extremely powerful CPUs with the capacity of carrying out 1 million instructions per second.

Fourth Generation Computers :

The fourth generation may be identified by the advent of the *microprocessor* chip, Medium scale integrated circuits yielded to Large and Very Large Scale Integrated circuits (VLSI) packing about 50000 transistors in a chip. Magnetic core memories were replaced by semiconductor memories. Semiconductor memory sizes of 16Megabytes with a cycle time of 200nsecs were in common use. The emergence of the microprocessor led to 2 directions in computer development. One direction was the emergence of extremely powerful personal computers . Computer cost came down so rapidly that professionals had their own computer to use in their office and home .Hard disks provided a low cost ,high capacity secondary memory.

Fourth generation saw the coming of age of UNIX OS and time shared interactive systems. These systems

became user friendly and highly reliable. The effective cost of computing came down. Computers also became all pervading.

Software :

Software is a set of a programs written to accomplish a task with the help of a computer system.They are intangible (can not be touched or moved) entities. Softwares can be classified into 2,they are :

1) *System S/W*

2) *Application S/W*

System S/W : System S/Ws are the softwares designed for the smooth functioning of the computer systems. All the Operating Systems,Compilers,Interpreters fall in this categories.

Application S/W : These are the softwares designed by the programmers for some particular task to be accomplished. E.g. MS Office,Tally,VB,etc.

Introduction to Operating System :

An Operating System is defined as a set of system programs that control and coordinate the operation of a computer system

An *operating system* is a program that acts as an intermediary between a user of a computer and the computer hardware. The purpose of an operating system is to provide an environment in which a user can execute programs. The primary goal of an operating system is thus to make the computer system convenient to use. A secondary goal is to use the computer hardware in an *efficient* manner.

An operating system is an important part of almost every computer system. A computer system can be divided roughly into 4 components : the hardware, the operating system, the applications programs, and the users.

The hardware - the central processing unit (CPU),the memory, and the input/output(I/O) devices - provides the basic computing resources.

The application program - such as compilers, database systems, games, and business programs - define the ways in which these resources are used to solve the computing problems of the users.

The operating systems controls and coordinates the use of hardware among the various application programs for the various uses.

We can view an operating system as a *resource allocator*.A computer system has many resources (h/w and s/w) that may be required to solve a problem: CPU time, memory space, file storage space, I/O devices and so on. The operating system acts as the manager of these resources and allocates them to specific programs and users as necessary for tasks. Since there may be many requests of resources , the operating systems decide which requests are allocated resources to operate the computer system efficiently and fairly.

It is easier to define operating systems by what they *do* than by what they *are*. The primary goal of an operating system is *convenience for the user*. Operating systems exist because they are supposed to make it easier to compute with them than without them.

Every operating system has a *kernel* or a *nucleus* which permanently resides in the main memory of a computer to perform some of the basic functions of OS and to access other portions as and when they are needed. The remaining parts of an OS are normally stored in a disk ready to be loaded into the main memory when required and ordered to do so by the kernel.

Following are the services which are provided for the convenience of the programmer , to make the programming task easier.

1) Programming Execution : The system must be able to load a program into memory and run to it.The program must be able to end its execution, either normally or abnormally (indicating error)

2) I/O operations : A running program may require I/O.This I/O may involve a file or an I/O device.For specific devices ,special functions may be desired. For efficiency and protection ,users usually cannot control I/O devices directly. Therefore the operating system must provide some means to do I/O.

3) File-system manipulation : The file system is of particular interest. It should be obvious that program need to read and write files. They also need to create and delete files by name.

4) Communications : There are many circumstances in which one process needs to exchange informations with another process. There are 2 major ways in which such communications can occur. The first takes place between processes executing on the same computer; the second takes place between processes executing on different computer systems that are tied together by a computer network. Communications may be implemented via *shared memory*, or by the technique of *message passing*, in which packets of information are moved between processes by the operating system.

5) Error detection : The OS constantly needs to be aware of possible errors.Errors may occur in the CPU and memory hardware ,in I/O devices or in the user program. For each type of error ,the operating system should take the appropriate action to ensure correct and consistent computing.

6) Resource allocation : When there are multiple users or multiple jobs running at the same time, resources must be allocated to each of them. Many different types of resources are managed by the operating system. Some may have special allocation code, whereas others may have much more general request and release code. For instance ,in determining how best to use the CPU ,operating systems have CPU-scheduling routines that take into account the speed of the CPU,the jobs that must be executed, the number of registers available and other factors.

There are 2 types of operating systems:

1) *Single user operating system* and 2) *Multi user operating system*

Single User OS : It caters the needs of one user at a time. Most of the single user OS have CUI(Character User Interface) features, as it only allows the commands to be typed in rather than clicking on the icons to perform or execute the corresponding program.E.g. DOS

Multi User OS : It entertains more than one user at a time taking care of all the operations in the respective machines. It supports both the CUI and GUI features E.g. Novel Netware OS,UNIX,Solaris and Windows 2000 Server.

Multi user operating system works in 4 different ways as :

- a) *Multasking OS*
- b) *Timesharing OS*
- c) *Real time OS*
- d) *Distributed OS*

Multasking OS :The OS which monitors multiple task simultaneously with in the stipulated time with perfection is referred as a Multitasking OS.E.g Windows NT,Linux,SCO Unix.

Timesharing OS : In a large network (mostly server centric) the server is equipped with this kind of OS which attends the request from the individual nodes in a time bound manner. The approach of the server to the request made by the individual node referred as a Round Robin League.E.g.Unix,Linux,Solaris,Windows NT. A time shared operating system allows a user to interact with the computer and it facilitates program development. The response time of a good computer system to users' requests is of the order of 1or 2 seconds. The availability of large disk storage in such systems makes it feasible to store large volumes of data and to retrieve them fast. This facility is very useful in implementing systems such as an airline reservation system. In such a system ,the response time should be very short because a customer's reservation to be done while he waits.

** *Time-sharing* systems were developed to provide interactive use of a computer system at a reasonable cost.A time-shared operating systems uses CPU scheduling and multiprogramming to provide each user with a small portion of a time-shared computer.It allows the many users to *share* the computer simultaneously. Since each action or command in a time shared system tends to be short ,only a little CPU time is needed for each user.

Real-Time OS: There are applications in which a computer is expected to control the operation of a physical

system. For example, a satellite in orbit may be controlled by a computer. The position, velocity, acceleration and spin information of the satellite may be fed to a computer which may be programmed to compute the orbit and give instructions to rocket motors to correct the orbit. In such an application the operation is in "real time", that is, the control has to be exercised during the actual functioning of the system. Any delay beyond that specified for control would be disastrous. Real time OS have to work within strict time limits for critical jobs. Critical jobs are locked in memory and receive the highest priority.

**A real-time system is used when there are rigid time requirements on the operation of a processor or the flow of data, and thus often used as a control device in a dedicated application. A real-time task cannot be kept waiting indefinitely for the kernel to run it.

Distributed OS :

The distributed operating system supports the distributed computing environments which consists distributed databases system. This OS coordinates the activities occurring on remote terminals. Example: IBM OS/2. It improves the performance of the data mines by providing the proper dead locks.

Interface :

An Interface can be defined as a link between the user and computer. It is a medium and format through which the user communicates with the computer. In actual fact we were communicating with the computer through the Dos. Interface are classified into two:

1) Character User Interface (CUI): - Character User Interface uses characters to help the user to communicate with the computer. DOS is a good example of CUI. To give any command in DOS we have to type it at the DOS prompt.

2) Graphic User Interface (GUI): - Graphic User Interface uses pictures, diagrams and graphics rather than characters, which helps the user to communicate with the computer. It follows the principles of "one picture is worth a thousand words". E.g. Windows

History Of Windows : - *Microsoft Windows 95 is a Graphic User Interface based Operating system. Which is a successor to DOS. Following are some of the limitations of DOS: -*

- 1) Non-Graphical, character based user interface.
- 2) Need for remembering and typing various commands
- 3) Mouse cannot be operated in DOS
- 4) Not possible to work on many program at a time.
- 5) Data interchange between packages is very difficult.

To overcome these limitations, Microsoft developed a new Graphical based package called windows. The result was windows 1.0 and then 2.0,2.1,3.0,3.1 and Windows 95. Microsoft had worked on project more to introduce windows 98 and now windows 2000. Microsoft introduced "Mouse" with big features. Mouse is considerably easier than using keyboard.

DESKTOP: - In Graphic User Interface, the computer screen is called a Desktop. It is similar to a top of our desk. On which we can arrange the files, books etc. in the way we want. In the same way in window desktop we can change the appearance, size and background of Desktop.

Why the name "Windows": - Any application you run in windows will be displayed in a rectangular area, and that is why it is named "Windows". The look or interface of any Windows application is very much common.

An O/S comes in various versions. Windows also have different versions as it is got developed. Following are some of the versions of MS-Windows: -

Features of Windows: -

- i) Can do all DOS's task like creating, renaming, deleting folders or directories, copying, moving files, formatting disk etc. No need to remember commands.
- ii) Run different programs in multiple windows.
- iii) Can interchange data between different applications through the facility of clipboard.
- iv) Do all advanced jobs like sending a fax, link up to an outside information service company through terminal etc.

Windows 95: - This is the advanced version of Windows 3.11. In this O/S, the barrier of installing DOS has been removed. There is no need to install MS-DOS separately because DOS was integrated within it. There are so many application built in the Windows that enhance Win-95 like we have Paintbrush, Notepad, WordPad, games like solitaire, minesweeper etc. Of course, there are several other major improvements in Windows 95 than Windows 3.11 and overall, it is much superior O/S.

Features: -

- i) The behavior and interface of Windows 95 is much easy than Windows 3.11.
- ii) It provides ways to organize and manage files stored on your computer.

Windows-98: - Windows 98 is an operating environment that is several steps ahead of the earlier versions of Windows. It provides the user with several options that allows a novice not only to use the computer expertly but also to exploit its full potential. It has been developed taking the Internet into consideration. Windows 98 can be said as true web integration. It is more User-friendly. It is more simple and flexible. It is faster as it includes tools that help your computer run faster than Windows 95 without adding new hardware like Maintenance Wizard, Drive Converter, Disk Defragmenter etc.

Features: -

- i) Internet has been given the basic importance.
- ii) It is more User-friendly and flexible.
- iii) Windows 98 includes a suite of programs designed to optimize your computer's efficiency, especially when used together like Maintenance wizard, Disk Cleanup etc.
- iv) Management of hardware and software made simple and easy.
- v) Windows 98 improves computer reliability by introducing new wizards, utilities, and resources that help keep your system running smoothly.

Windows XP :

It is the state of art OS from Microsoft which have both the individual as well as the network computing skills. It also supports the speech recognition system . It has the same directory structure as that of the Microsoft Windows NT Server.

Desktop: - The Desktop is the large blank area along with some system standard icons as shown in the screen. You can customize the Desktop by adding your applications on the desktop in the form of icons.

Desktop Icons: - Icon is a small graphic symbol that represents an image on console. The common desktop icons are My Computer, Network Neighborhood, Recycle Bin, Internet Explorer etc. We can open the application by double-clicking it.

Taskbar: - The taskbar is the bar on your desktop that includes the 'Start' button. Buttons representing programs currently running on your computer appears on this bar. Taskbar can also be used to switch between two or more applications.

Taskbar Clock: - We can have a Clock on the right bottom of the taskbar. We can change the Time as well as Date of our system. Windows uses the time setting to identify when files are created and modified.

Start Button: - Most of the processes in Windows are performed with the 'Start' Button. It is generally appears at the bottom left corner of the screen. We can get Sub-Menu after clicking on Main Menu 'Start' like Programs, Documents, Settings, Find, Run etc.

Let us see the Sub-Menu of the 'Start' Button: -

'Start' Buttons Sub-Menu	Description
Programs	The software installed on your computer
Documents	The recently opened or used Documents
Settings	To personalize the settings of system
Find	To search the files/folders saved on your system
Run	To start the program after specifying the correct path.

Introduction to Control Panel: -

Control panel is a tool to control or manage all the hardwares and at the same time to personalize your computer.

Some of the options available with control panel are: -

Name	Description
Date/Time	Changes date, time and time zone information.
Display	Changes Display Settings.

Accessories: -

'Accessories' is one of the groups created by default in Programs option. This group contains a set of program items used for the following purposes: -

Programs	Uses
Paint	For making bitmaps
Calculator	For standard and scientific calculations
Notepad	For creating simple (unformatted) text
Word Pad	For creating formatted documents/letters
Clipboard Viewer	For copying text from a window

Windows Explorer: -

'Windows Explorer' is a tool used for listing files present on your hard disk or on the floppy disk (if you have a floppy drive with a floppy disk in it) or on the CD (if you have CD-Drive with a CD in it). Explorer displays drives, available folders and files in a single window in which you can navigate.

Windows Explorer as you notice displays two columns. The left hand side column is titled 'All Folders'. This displays a list of all the folders available on your hard disk. The right hand side column is titled as 'Content of (C:)'. By default, Explorer displays the names of the folders both the columns. However, when you click on any folder in the left hand side column, Explorer will display the content of that folder in the right hand side column.

- I. File:** - A named collection of information stored on a disk, usually contains data, graphics or a program.
- II. File Name:** - Any name given to information saved on a disk. A filename may be as long as 255 characters and may include a three letter extension, such as CYBERPANET.TXT etc.
- III. Folder/Directory:** - A container that allows any collection of objects to be grouped, for example, a set of text files._

Some Additional Concepts: -

- I. Clipboard:** - An area in memory where objects can be stored temporarily, for cut-paste procedures. To open the Clipboard, choose Programs->Accessories->System Tools-> Clipboard Viewer.
- II. Character Based:** - Prefers to non-Windows applications. Character-based application display information using the ASCII character set, or characters normally found on the keyboard.
- III. Disk:** - A magnetically coated disk used to store information.
- IV. Memory:** - A type of electronic circuitry that the computer uses to store programs and data. Unlike disk storage, which is permanent, a computers working memory is temporary. Its contents are lost when power is removed.

V. Menu: - A list of available options.

VI. Recycle Bin: - This folder contains files and folders that you have deleted from your computer that you can permanently remove or restore.

Information System :

It can be described as a set of elements connected together for retrieving, processing and outputting the data in an appropriate format for the purpose of common objective. System develops with the sub components as an integral part of the large system by the making information exchange.

Every information system integrates the following parts:

- 1) Resource Flows
- 2) Functions of Management
- 3) Organizational Theory and
- 4) Various techniques

The main task of Information System is to construct the conceptual model through which you can understand how to manage the transformation of resource flows and thus to achieve the common objective. It collects, analyzes, stores and also displays data required to the decision maker at all levels.

Before making the computerization of any activity it is necessary to analyze the present system and system sub-components. Development of system analysis necessarily needs the following steps.

- 1) Problem identification
- 2) Para -computing Area i.e. Data collection and preparation
- 3) Implementation by using Computer system.

In order to make the computerization you select the appropriate S/w and Data handling systems. It gives outputs in the proper format and up to the mark.

Computer based information systems are now available for the general public in many areas. Web services, Data transfer, e-mails, and other systems of such types are the few examples of it.

Bus System :

The *bus* is the highway system for this data. The bus transports data among the processor, memory, and other components. The bus includes a complex conglomeration (collection) of skinny electrical circuits called *traces* printed on the top and bottom of the motherboard, which is the main circuit board in your PC. But there's no single part of the PC's motherboard you can point to and say it's the bus.

The bus also includes assorted microchips and the slots into which we plug expansion circuit boards - often called *adapters or expansion cards*. Sometimes the bus is called the expansion bus, and the slots lined with dozens of metallic contacts are called expansion or adapter slots.

The basic idea of the bus introduced on the IBM PC in 1981 was so good and so versatile that for years, there were few changes. But today there are many types of PC buses. All of them represent improvements in moving data still faster among components.

The first change in the original PC bus was to increase its ability to move only 8 bits of data at a time. When IBM introduced the IBM AT computer in 1984, the new system included expansion slots with more connectors to send 16 bits of data at a time. This bus called ISA, for *Industry Standard Architecture*, still appears in most new PCs today, although usually in combination with other types of expansion slots.

To bring the bus up to speed, the *local bus* was created, "Local" refers to bus lines used by the processor. Some of those local bus lines lead to expansion slots, giving the slot local, or direct, access to the processor. The advantage of the local bus is that it theoretically communicates with the processor at the processor's own speed. Local bus offers no enhancement for sending data to modems and printers which are their own bottlenecks.

A computer consists of 3 buses as listed below:

1) Data Bus (External and Internal)

2) Address Bus

3) Control Bus

The "**external data bus**" connects the memory with a CPU register called "**Memory Buffer Register (MBR)**" or "**Memory Data Register (MDR)**". The "**internal data bus**" connects all the CPU registers, including MBR.

In some architectures, the external and internal data buses are combined into a single data bus, in which case, theoretically, there is no need for a register such as MBR. This is because, in this case, data from any memory location can be moved to any CPU register directly and vice versa without the mediation of MBR.

The "**Address Bus**" carries the address of the memory location to be accessed. There is a CPU register called "**Memory Address Register (MAR)**" which has to contain the address of the memory location to be accessed.

The "**control bus**" carries all the control signals.