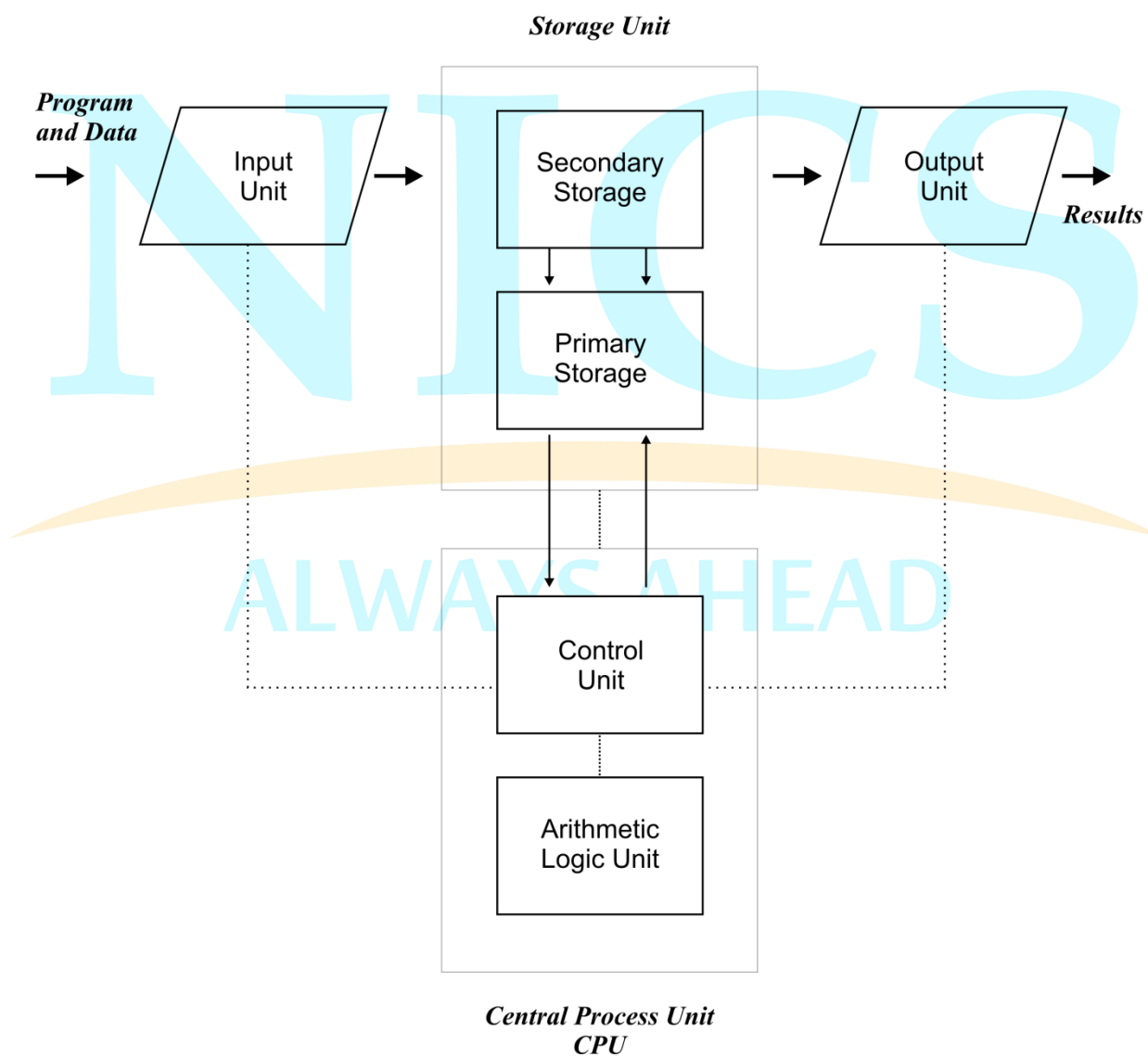


Definition

Computer System is an electronic data processing device, which does the following:

- Accept and store an input data.
- Process the data input.
- And output the processed data in required format.

BASIC COMPUTER ORGANIZATION



All computer Systems perform the following five basic operations for converting raw input data into information, which are useful to their uses.

Inputting: The process of entering data and instruction into the Computer.

Storing: Saving data and instructions to make them readily available for initial or additional process as and when required.

Processing: Performing Arithmetic operations (add, Subtract, Multiply and Division) or logical operations such as comparison of values.

Outputting: The process of producing useful information or results for the user such as printed reports or visual displays.

Controlling: directing the manner and sequences in which all of above operations are performed

Features of Computer

Following list demonstrates the advantages of Computers in today's arena.

High speed

- Computer is a very fast device.
- It is capable of performing addition of very big data.
- The computer has units of speed in microsecond, nanosecond and even the picosecond.
- It can perform millions of calculations in a few seconds as compared to man, who can spend many months for doing the same task.

Accuracy

- In addition to being very fast, computers are very accurate.
- The computer has performed calculations 100% error-free.
- Computers perform all jobs with 100% accuracy.

Storage capability

- Memory is a very important characteristic of computers.
- The computer has much more storage capacity than human beings.
- It can store large amount of data.
- It can store any type of data such as images, videos, text, audio and any other type.

Diligence

- Unlike human beings, a computer is free from monotony, tiredness and lack of concentration.
- It can work continuously without creating any error and boredom.
- It can do repeated work with same speed and accuracy.

Versatility

- A computer is a very versatile machine.
- A computer is very flexible in performing the jobs to be done.
- This machine can be used to solve the problems relating to various different fields.
- At one instant, it may be solving a complex scientific problem and the very next moment it may be playing a card game.

Reliability

- A computer is a reliable machine.
- Modern electronic components have failure-free long lives.
- Computers are designed to make maintenance easy.

Automation

- Computer is an automatic machine.
- Automation means ability to perform the task automatically.
- Once a program is given to computer, i.e., stored in computer memory, the program and instructions can control the program execution without human interaction.

Reduction in paper work

- The use of computers for data processing in an organization leads to reduction in paper work and speeds up the process.
- As data in electronic files can be retrieved as and when required, the problem of maintenance of large number of files gets reduced.

Reduction in cost

- Though the initial investment for installing a computer is high but it substantially reduces the cost of each of its transaction.

No IQ

- A computer is a machine and has no intelligence of its own to perform any task.

- Each and every instruction has to be given to the computer.
- A computer can't take any decision on its own.

Dependency

- It can perform function as instructed by user, so it is fully dependent on human being.

Environment

- The operating environment of computer should be dust-free and suitable to it.

No feeling

- Computer has no feeling or emotions.
- It cannot make judgments based on feeling, taste, experience and knowledge unlike a human being.

Computer Applications

Following list demonstrates the various applications of Computers in today's arena.

Business

The computer's characteristic as high speed of calculation, diligence, accuracy, reliability, or versatility has made it an integrated part in all business organizations.

Computer is used in business organization for:

- Payroll Calculations
- Budgeting
- Sales Analysis
- Financial forecasting
- Managing employees database
- Maintenance of stocks, etc.

Banking

Today Banking is almost totally dependent on computer.

Banks provide following facilities:

- Banks on-line accounting facility, which includes current balances, deposits, overdrafts, interest charges, shares and trustee records.
- ATM machines are making it even easier for customers to deal with banks.

Insurance

Insurance companies are keeping all records up-to-date with the help of computers. The Insurance Companies, Finance houses and Stock broking firms are widely using computers for their concerns.

Insurance Companies are maintaining a database of all clients with information showing:

- how to continue with policies
- starting date of the policies
- next due installment of a policy
- maturity date
- interests due
- survival benefits
- bonus

Education

The computer has provided a lot of facilities in the Education System.

- The uses of computer provide a tool in the Education system known as CBE (Computer Based Education).
- CBE involves Control, Delivery and Evaluation of learning.
- The computer education is very familiar and rapidly increasing the graph of computer students.
- There are number of methods in which educational institutions can use computer to educate the students.
- It is used for prepare a database about student performance and analyses are carried out.

Marketing

In Marketing uses of computer are following:

- **Advertising:** With computers, advertising professionals create art and graphics, write and revise copy, and print and disseminate ads with the goal of selling more products.

- **At Home Shopping:** Home shopping has been made possible through use of computerized catalogues that provide access to product information and permit direct entry of orders to be filled by the customers.

Health Care

Computers have become important part in all Medical Systems.

The computers are being used in hospitals to keep the record of patients and medicines. It is also used in scanning and diagnosing different diseases. ECG, EEG, Ultrasounds and CT Scans, etc., are also done by computerized machines.

Some of major fields of health care in which computers are used:

- **Diagnostic System:** Computers are used to collect data and identify cause of illness.
- **Lab-diagnostic System:** All tests can be done and reports are prepared by computer.
- **Patient Monitoring System:** These are used to check patient's signs for abnormality such as in Cardiac Arrest, ECG, etc.
- **Pharma Information System:** Computer checks Drug-Labels, Expiry dates, harmful drug side effects, etc.
- Nowadays, computers are also used in performing surgery.

Engineering Design

Computers are widely used in Engineering purposes.

One of major areas is CAD (Computer aided design). CAD provides creation, edition, and modification of image. Some fields are:

- **Structural Engineering:** Requires stress and strain analysis required for design of Ships, Buildings, Budgets, Airplanes, etc.
- **Industrial Engineering:** Computers deal with design, implementation and improvement of Integrated systems of people, materials and equipments.
- **Architectural Engineering:** Computers help in planning towns, designing buildings, determining a range of buildings on a site using both 2D and 3D drawings.

Military

Computers are largely used in defence. Modern tanks, missiles, weapons, etc., employ computerized control systems. Some military areas where a computer has been used are:

- Missile Control
- Military Communication

- Military operation and planning
- Smart Weapons

Communication

Communication means to convey a message, an idea, a picture or speech that is received and understood clearly and correctly by the person for whom it is meant. Some main areas in this category are:

- E-mail
- Chatting
- Usenet
- FTP
- Telnet
- Video-conferencing

Government Applications

Computers play an important role in government applications. Some major fields in this category are:

- Budgets
- Sales tax department
- Income tax department
- Male/Female ratio
- Computerization of voters lists
- Computerization of Driving Licensing system
- Computerization of PAN card
- Weather Forecasting.

Classification of Computers

Computers can be broadly classified by their speed and computing power.

Sr. No.	Type	Specifications
1	PC (Personal Computer)	Single user computer system. Moderately powerful microprocessor.
2	WorkStation	Single user computer system. Similar to Personal Computer but have more powerful microprocessor.

3	Mini Computer	Multi-user computer system. Capable of supporting hundreds of users simultaneously.
4	Main Frame	Multi-user computer system. Capable of supporting hundreds of users simultaneously. Software technology is different from minicomputer.
5	Supercomputer	An extremely fast computer, which can perform hundreds of millions of instructions per second.

PC (Personal Computer)

A PC can be defined as a small, relatively inexpensive computer designed for an individual user. PCs are based on the microprocessor technology that enables manufacturers to put an entire CPU on one chip. Businesses use personal computers for word processing, accounting, desktop publishing, and for running spreadsheet and database management applications. At home, the most popular use for personal computers is for playing games and surfing the Internet.

Although personal computers are designed as single-user systems, these systems are normally linked together to form a network. In terms of power, nowadays high-end models of the Macintosh and PC offer the same computing power and graphics capability as low-end workstations by Sun Microsystems, Hewlett-Packard, and DELL.

WorkStation

Workstation is a computer used for engineering applications (CAD/CAM), desktop publishing, software development, and other such types of applications, which require a moderate amount of computing power and relatively high quality graphics capabilities.

Workstations generally come with a large, high-resolution graphics screen, large amount of RAM, inbuilt network support, and a graphical user interface. Most workstations also have a mass storage device such as a disk drive, but a special type of workstation, called a diskless workstation, comes without a disk drive.

Common operating systems for workstations are UNIX and Windows NT. Like PC, Workstations are also single-user computers. However, workstations are typically linked together to form a local-area network, although they can also be used as stand-alone systems.

Minicomputer

It is a midsize computer. A minicomputer is a multi-processing system capable of supporting from up to 250 users simultaneously.

Minicomputers have a greater storage capacity and are faster than micro computers. Most minis can process several programs at a time and can be used by several people simultaneously. Small to medium sized business use mini computers for their daily processing needs.

Mainframe

Mainframe is a very large in size, having greater storage capacity and very powerful processing speed. It is an expensive computer capable of supporting hundreds, or even

thousands, of users simultaneously. Mainframe executes many programs concurrently. Mainframes support many simultaneous programs execution

Mainframes are the principle computers used by medium and large sized businesses for their data processing needs. For example, the computer used with ATM (Automatic Telling Machine) would probably be a mainframe.

Supercomputer

Supercomputers are one of the fastest computers currently available. Supercomputers are very expensive and are employed for specialized applications that require immense amounts of mathematical calculations (number crunching).

For example, weather forecasting, scientific simulations, (animated) graphics, fluid dynamic calculations, nuclear energy research, electronic design, and analysis of geological data (e.g. in petrochemical prospecting).

Computer Hardware

Hardware represents the physical and tangible components of the computer, i.e., the components that can be seen and touched.

Examples of Hardware are following:

- **Input devices** -- keyboard, mouse, etc.
- **Output devices** -- printer, monitor, etc.
- **Secondary storage devices** -- Hard disk, CD, DVD, etc.
- **Internal components** -- CPU, motherboard, RAM, etc.

All types of computers follow a same basic logical structure and perform the following five basic operations for converting raw input data into information useful to their users

Sr. No.	Operation	Description
1	Take Input	The process of entering data and instructions into the computer system.
2	Store Data	Saving data and instructions so that they are available for processing as and when required.
3	Processing Data	Performing arithmetic, logical operations on data in order to convert them into useful information.
4	Output Information	The process of producing useful information or results for the user, such as a printed report or visual display.
5	Control the workflow	Direct the manner and sequence in which all of the above operations are performed.

Input Unit

This unit contains devices with the help of which we enter data into computer. This unit makes link between user and computer.

The input devices translate the human being information into the form understandable by computer.

CPU (Central Processing Unit)

CPU is considered as the brain of the computer. CPU performs all types of data processing operations. It stores data, intermediate results and instructions (program). It controls the operations of all parts of computer.

CPU itself has the following three components

- ALU (Arithmetic Logic Unit)
- Memory Unit
- Control Unit

Output Unit

Output unit consists of devices with the help of which we get the information from computer. This unit is a link between computer and users.

Output devices translate the computer's output into the form understandable by users.

CPU

- CPU is considered as the brain of the computer.
- CPU performs all types of data processing operations.
- It stores data, intermediate result and instructions (program).
- It controls the operations of all parts of computer.



CPU itself has the following three components.

- Memory or Storage Unit:

- Control Unit
- ALU (Arithmetic Logic Unit)

Memory or Storage Unit:

This unit can store instructions, data and intermediate results. This unit supplies information to the other units of the computer when needed. It is also known as internal storage unit or main memory or primary storage or Random access memory(RAM).

Its size affects speed, power and capability. There are primary memory and secondary memory, two types of memories in the computer. Functions of Memory Unit are:

- It stores all the data to be processed and the instructions required for processing.
- It stores intermediate results of processing.
- It stores final results of processing before these results are released to an output device.
- All inputs and outputs are transmitted through main memory.

Control Unit

This unit controls the operations of all parts of computer. It does not carry out any actual data processing operations.

Functions of this unit are:

- It is responsible for controlling the transfer of data and instructions among other units of a computer.
- It manages and coordinates all the units of the computer.
- It obtains the instructions from the memory, interprets them and directs the operation of the computer.
- It communicates with Input / Output devices for transfer of data or results from storage.
- It does not process or store data.

ALU (Arithmetic Logic Unit)

This unit consists of two subsections namely:

- Arithmetic Section
- Logic Section

Arithmetic section

Function of Arithmetic section is to perform arithmetic operations like addition, subtraction, multiplication and division. All complex operations are done by making repetitive use of above operations.

Logic Section

Function of logic section is to perform logic operations such as comparing, selecting, matching and merging of data.

Input Devices

Following are few of the important input devices, which are used in Computer Systems:

- Keyboard
- Mouse
- Joystick
- Light pen
- Track Ball
- Scanner
- Graphic Tablet
- Microphone
- Magnetic Ink Card Reader (MICR)
- Optical Character Reader (OCR)
- Bar Code Reader
- Optical Mark Reader

Keyboard

- Most common and very popular input device is keyboard. The keyboard helps in inputting the data to the computer. The layout of the keyboard is like that of traditional typewriter, although there are some additional keys provided for performing some additional functions.
- Keyboards are of two sizes 84 keys or 101/102 keys, but now 104 keys or 108 keys keyboard is also available for Windows and Internet.
- The keys are following

Sr. No.	Keys	Description
1	Typing Keys	These keys include the letter keys (A-Z) and digits keys (0-9) which generally give same layout as that of typewriters.
2	Numeric Keypad	It is used to enter numeric data or cursor movement. Generally, it consists of a set of 17 keys that are laid out in the same configuration used by most adding machine and calculators.
3	Function Keys	The twelve functions keys are present on the keyboard. These are arranged in a row along the top of the keyboard. Each function key has unique meaning and is used for some specific purpose.
4	Control keys	These keys provide cursor and screen control. It includes four directional arrow key. Control keys also include Home, End, Insert, Delete, Page Up, Page Down, Control(Ctrl), Alternate(Alt), Escape(Esc).
5	Special Purpose Keys	Keyboard also contains some special purpose keys such as Enter, Shift, Caps Lock, Num Lock, Space bar, Tab, and Print Screen.

Mouse

Mouse is most popular Pointing device. It is a very famous cursor-control device. It is a small palm size box with a round ball at its base which senses the movement of mouse and sends corresponding signals to CPU on pressing the buttons.

Generally, it has two buttons called left and right button and scroll bar is present at the mid. Mouse can be used to control the position of cursor on screen, but it cannot be used to enter text into the computer.

Advantages

- Easy to use
- Not very expensive
- Moves the cursor faster than the arrow keys of keyboard.

Joystick

- Joystick is also a pointing device, which is used to move cursor position on a monitor screen. It is a stick having a spherical ball at its both lower and upper ends. The lower spherical ball moves in a socket. The joystick can be moved in all four directions.
- The function of joystick is similar to that of a mouse. It is mainly used in Computer Aided Designing (CAD) and playing computer games.



Light Pen

Light pen is a pointing device, which is similar to a pen. It is used to select a displayed menu item or draw pictures on the monitor screen. It consists of a photocell and an optical system placed in a small tube.

When light pen's tip is moved over the monitor screen and pen button is pressed, its photocell sensing element, detects the screen location and sends the corresponding signal to the CPU.



Scanner

Scanner is an input device, which works more like a photocopy machine. It is used when some information is available on a paper and it is to be transferred to the hard disc of the computer for further manipulation.

Scanner captures images from the source which are then converted into the digital form that can be stored on the disc. These images can be edited before they are printed.



Digitizer

Digitizer is an input device, which converts analog information into a digital form. Digitizer can convert a signal from the television camera into a series of numbers that could be stored in a computer. They can be used by the computer to create a picture of whatever the camera had been pointed at.

Digitizer is also known as Tablet or Graphics Tablet because it converts graphics and pictorial data into binary inputs. A graphic tablet as digitizer is used for doing fine works of drawing and images manipulation applications.



Magnetic Ink Card Reader (MICR)

MICR input device is generally used in banks because of a large number of cheques to be processed everyday. The bank's code number and cheque number are printed on the cheques with a special type of ink that contains particles of magnetic material that are machine readable.

This reading process is called Magnetic Ink Character Recognition (MICR). The main advantage of MICR is that it is fast and less error prone.



Optical Character Reader (OCR)

OCR is an input device used to read a printed text. OCR scans text optically character by character, converts them into a machine readable code and stores the text on the system memory.



Bar Code Readers

Bar Code Reader is a device used for reading bar coded data (data in form of light and dark lines). Bar coded data is generally used in labelling goods, numbering the books, etc. It may be a hand-held scanner or may be embedded in a stationary scanner.

Bar Code Reader scans a bar code image, converts it into an alphanumeric value, which is then fed to the computer to which bar code reader is connected.



NILUS

Optical Mark Reader (OMR)

OMR is a special type of optical scanner used to recognize the type of mark made by pen or pencil. It is used where one out of a few alternatives is to be selected and marked. It is specially used for checking the answer sheets of examinations having multiple choice questions.



Computer Memories

A memory is just like a human brain. It is used to store data and instructions. Computer

memory is the storage space in computer where data is to be processed and instructions required for processing are stored.

The memory is divided into large number of small parts. Each part is called cell. Each location or cell has a unique address, which varies from zero to memory size minus one.

For example, if computer has 64k words, then this memory unit has $64 * 1024 = 65536$ memory location. The address of these locations varies from 0 to 65535.

Memory is primarily of three types:

- Cache Memory
- Primary Memory/Main Memory
- Secondary Memory

Primary Memory (Main Memory)

Primary memory holds only those data and instructions on which computer is currently working. It has limited capacity and data gets lost when power is switched off.

It is generally made up of semiconductor device. These memories are not as fast as registers. The data and instructions required to be processed earlier reside in main memory. It is divided into two subcategories RAM and ROM.

Characteristic of Main Memory

- These are semiconductor memories.
- It is known as main memory.
- Usually volatile memory.
- Data is lost in case power is switched off.
- It is working memory of the computer.
- Faster than secondary memories.
- A computer cannot run without primary memory.



A RAM constitutes the internal memory of the CPU for storing data, program and program result. It is read/write memory. It is called random access memory (RAM).

Since access time in RAM is independent of the address to the word that is, each storage location inside the memory is as easy to reach as other location & takes the same amount of time. We can reach into the memory at random & extremely fast but can also be quite expensive.

RAM is volatile, i.e., data stored in it is lost when we switch off the computer or if there is a power failure. Hence, a backup uninterruptible power system (UPS) is often used with computers. RAM is small, both in terms of its physical size and in the amount of data it can hold.

RAM is of two types:

- Static RAM (SRAM)
- Dynamic RAM (DRAM)

Secondary Memory

This type of memory is also known as external memory or non-volatile. It is slower than main memory. These are used for storing Data/Information permanently.

CPU directly does not access these memories, instead they are accessed via input-output routines. Contents of secondary memories are first transferred to main memory and then CPU can access it. For example, disk, CD-ROM, DVD, etc.

Characteristics of Secondary Memory

- These are magnetic and optical memories.
- It is known as backup memory.
- It is non-volatile memory.
- Data is permanently stored even if power is switched off.
- It is used for storage of the data in the computer.
- Computer may run without secondary memory.
- Slower than primary memories.



ROM (Read Only Memory)

ROM stands for Read Only Memory. The memory from which we can only read but cannot write on it. This type of memory is non-volatile. The information is stored permanently in such memories during manufacture.

A ROM stores such instructions as are required to start computer when electricity is first turned on, this operation is referred to as bootstrap. ROM chip are not only used in the computer but also in other electronic items like washing machine and microwave oven.

Following are the various types of ROM:

MROM (Masked ROM)

The very first ROMs were hard-wired devices that contained a pre-programmed set of data or instructions. These kinds of ROMs are known as masked ROMs. It is inexpensive ROM.

PROM (Programmable Read only Memory)

PROM is read-only memory that can be modified only once by a user. The user buys a blank PROM and enters the desired contents using a PROM programmer. Inside the PROM chip, there are small fuses, which are burnt open during programming. It can be programmed only once and is not erasable.

EPROM (Erasable and Programmable Read Only Memory)

The EPROM can be erased by exposing it to ultra-violet light for a duration of up to 40 minutes. Usually, an EPROM eraser achieves this function. During programming, an

electrical charge is trapped in an insulated gate region. The charge is retained for more than ten years because the charge has no leakage path. For erasing this charge, ultra-violet light is passed through a quartz crystal window (lid). This exposure to ultra-violet light dissipates the charge. During normal use the quartz lid is sealed with a sticker.

EEPROM (Electrically Erasable and Programmable Read Only Memory)

The EEPROM is programmed and erased electrically. It can be erased and reprogrammed about ten thousand times. Both erasing and programming take about 4 to 10 ms (milli second). In EEPROM, any location can be selectively erased and programmed. EEPROMs can be erased one byte at a time, rather than erasing the entire chip. Hence, the process of re-programming is flexible but slow.

Advantages of ROM

- Non-volatile in nature
- These can not be accidentally changed
- Cheaper than RAMs
- Easy to test
- More Reliable than RAMs
- These are static and do not require refreshing
- Its contents are always known and can be verified

Output Devices

Following are few of the important output devices, which are used in Computer Systems:

- Monitors
- Graphic Plotter
- Printer

Monitors

Monitor commonly called as Visual Display Unit (VDU) is the main output device of a computer. It forms images from tiny dots, called pixels that are arranged in a rectangular form. The sharpness of the image depends upon the number of the pixels.

There are two kinds of viewing screen used for monitors:

- Cathode-Ray Tube (CRT)
- Flat-Panel Display

Cathode-Ray Tube (CRT) Monitor

In the CRT, display is made up of small picture elements called pixels for short. The smaller the pixels, the better the image clarity or resolution. It takes more than one illuminated pixel to form whole character, such as the letter 'e' in the word help.

A finite number of characters can be displayed on a screen at once. The screen can be divided into a series of character boxes - fixed location on the screen where a standard character can be placed.

Most screens are capable of displaying 80 characters of data horizontally and 25 lines vertically. There are some disadvantages of CRT:

- Large in Size
- High power consumption



Flat-Panel Display Monitor

The flat-panel display refers to a class of video devices that have reduced volume, weight and power requirement compared to the CRT. You can hang them on walls or wear them on your wrists. Current uses for flat-panel displays include calculators, video games, monitors, laptop computer, graphics display.

The flat-panel display are divided into two categories:

- **Emissive Displays** - The emissive displays are devices that convert electrical energy into light. Examples are plasma panel and LED (Light-Emitting Diodes).
- **Non-Emissive Displays** - The Non-emissive displays use optical effects to convert sunlight or light from some other source into graphics patterns. Example is LCD (Liquid-Crystal Device)



Printers

Printer is the most important output device, which is used to print information on paper.

There are two types of printers:

- Impact Printers
- Non-Impact Printers

Impact Printers

The printers that print the characters by striking against the ribbon and onto the paper, are called impact printers.

Characteristics of Impact Printers are the following:

- Very low consumable costs
- Impact printers are very noisy
- Useful for bulk printing due to low cost
- There is physical contact with the paper to produce an image

These printers are of two types:

- Character printers
- Line printers

Character Printers:

Character Printers are printers, which print one character at a time.

These are of further two types:

- Dot Matrix Printer (DMP)
- Daisy Wheel

Dot Matrix Printer

In the market, one of the most popular printer is Dot Matrix Printer because of their ease of printing features and economical price. Each character printed is in form of pattern of Dot's and head consists of a Matrix of Pins of size (5*7, 7*9, 9*7 or 9*9) which comes out to form a character that is why it is called Dot Matrix Printer.

Advantages of Dot Matrix Printer:

- Inexpensive
- Widely Used
- Other language characters can be printed

Disadvantages of Dot Matrix Printer

- Slow Speed
- Poor Quality



Daisy Wheel

Head is lying on a wheel and Pins corresponding to characters are like petals of Daisy (flower name) that is why it is called Daisy Wheel Printer. These printers are generally used for word-processing in offices which require a few letters to be send here and there with very nice quality representation.

Advantages

- More reliable than DMP's
- Better quality
- The fonts of character can be easily changed.

Disadvantages

- Slower than DMP's
- Noisy
- More expensive than DMP's

Non-impact Printers

The printers that print the characters without striking against the ribbon and onto the paper are called Non-impact Printers. These printers print a complete page at a time, also called as Page Printers.

These printers are of two types:

- Laser Printers
- Inkjet Printers

Characteristics of Non-impact Printers:

- Faster than impact printers.
- They are not noisy.
- High quality.
- Support many fonts and different character size.

Laser Printers

These are non-impact page printers. They use laser lights to produce the dots needed to form the characters to be printed on a page.

Advantages

- Very high speed.
- Very high quality output.
- Gives good graphics quality.
- Supports many fonts and different character sizes.

Disadvantage

- Expensive.

- Cannot be used to produce multiple copies of a document in a single printing.



Inkjet Printers

Inkjet printers are non-impact character printers based on a relatively new technology. They print characters by spraying small drops of ink onto paper. Inkjet printers produce high quality output with presentable features.

They make less noise because no hammering is done and these have many styles of printing modes available. Colour printing is also possible. Some models of Inkjet printers can produce multiple copies of printing also.

Advantages

- High quality printing
- More reliable

Disadvantages

- Expensive as cost per page is high
- Slow as compared to laser printer



Computer Software

Software is a set of programs, which are designed to perform a well-defined function. A program is a sequence of instructions written to solve a particular problem.

There are two types of software:

- System Software
- Application Software

System Software

The system software is a collection of programs designed to operate, control and extend the processing capabilities of the computer itself. System software are generally prepared by computer manufacturers.

These software comprise of programs written in low level languages which interact with the hardware at a very basic level. System software serves as the interface between hardware and the end users.

Some examples of system software are Operating System, Compilers, Interpreter, Assemblers, etc.



Features of System Software are the following:

- Close to system.
- Fast in speed.
- Difficult to design.
- Difficult to understand.
- Less interactive.
- Smaller in size.
- Difficult to manipulate.
- Generally written in low-level language.

Application Software

Application software are the software that are designed to satisfy a particular need of a particular environment. All software prepared by us in the computer lab can come under the category of Application Software.

Application software may consist of a single program, such as a Microsoft's notepad for writing and editing simple text. It may also consist of a collection of programs, often called a software package, which work together to accomplish a task, such as a spreadsheet package.

Examples of Application software are the following:

- Payroll Software
- Student Record Software
- Inventory Management Software
- Income Tax Software
- Railways Reservation Software
- Microsoft Office Suite Software
- Microsoft Word
- Microsoft Excel
- Microsoft Power-point



Features of Application Software are the following:

- It is close to user.
- It is easy to design.
- More interactive.
- Slow in speed.
- Generally written in high-level language.
- Easy to understand.
- Easy to manipulate and use.
- Bigger in size and requires large storage space.

NICS



ALWAYS AHEAD

UNDERSTANDING MICROSOFT WINDOWS XP PROFESSIONAL

Introduction

Microsoft Windows XP Professional is the program that governs all operations on your computer. Windows XP uses a graphical user interface (GUI) consisting of windows, menus, icons, and dialog boxes to help you tell your computer what to do. Windows XP presents options and commands to you, accepts your responses, and translates them into commands for your computer. Windows XP eliminates the need for you to remember and type complex commands that require exact syntax.

Using Windows XP to Interact With Your Computer:

Windows XP allows you to communicate with the computer and control these devices by using menus and dialog boxes to request and accept information from you.

Recycle Bin

Whenever you delete a folder or file from your computer, Windows places the item in the Recycle Bin. The Recycle Bin allows you to retrieve items that you accidentally deleted or items you decided were important after all.

The Desktop and Taskbar:

The Desktop and Taskbar always appear on the screen when you start Windows XP. The Desktop and the Taskbar serve as the main graphical interface to your computer. Together, the Desktop and the Taskbar cover the entire computer screen. You can access all your programs and files from either the Desktop or the Taskbar.

The Desktop

The Desktop takes up the majority of the space on the screen. The Desktop lists program icons which you can use to start a program. (Not every program on your computer is represented by an icon on the desktop, however). Each time you start a program, it appears in the Desktop. As a result, the program icons may not always appear on the screen.

Just as programs and documents you place on your office desktop, eventually, your electronic folders and documents may overlap on the computer desktop. Also like the folders and documents on your desk, you can reshuffle, close, and throw away the folders and documents on your electronic.

- **My Computer:** Provides access to different storage devices. For more information
- **My Network Places:** If a machine is located on a network, this will provide access to shared folders on other computers across the network.
- **Recycle Bin:** The Recycle Bin is the place to drop files and folders when they are no longer needed on a computer. Once the recycle bin is emptied, the files that were in it are permanently deleted from the system.
- **My Documents:** This is a folder designed to store all of a user's documents created in various programs.

The Taskbar

The Taskbar is a thin, horizontal bar below the Desktop. By default, the Taskbar always appears on the screen, even when you have a program running. The Taskbar always contains the start button, buttons for open programs, and a clock. The Taskbar allows you to quickly start programs, manage tasks on the Desktop and on your computer, and exit windows. From the taskbar, you can start any program on your computer and access any document.

The Window

A window is simply a framed region on the Desktop. Each Window contains a different program or document. The number of windows which can appear on the Desktop depends on your computer's memory, the windows program, the amount of memory your programs require, and the manner in which you choose to display them.

Types of Windows:

Windows XP uses two types of windows, program windows and document windows.

Program Window:

A computer program is a set of instructions that perform a specific task, such as word processing or data management. Each time you open a program, Windows XP opens a program window through which you enter commands for the program. The more programs you start, the more windows you open. As a result, you may have several program windows open on your Desktop at the same time. A program window might contain several document windows. You can only enter commands through a program window.

Document Window:

A document is any information you create with a program, such as a letter, spreadsheet, or database file. When you open or create a document in a program, you open a document window. Each document window contains a single document and always appears in the program window's work area. This type of window is sometimes referred to as a child window.

Window Borders:

Window borders are the four edges that define a window.

Control Menu:

The control menu lets you move, close, or change the size of a window.

Title Bar:

The Title bar is a horizontal bar directly below the window's top border between the Control menu and the resize buttons. The title bar lists the window's name.

Resize and Close Button:

The resize and close button appear in the top, right corner of the window. You must pointer to activate these buttons. The resize buttons perform the same tasks as the sizing commands on the File menu. Therefore, you may find it easier to use the menu commands rather than these buttons. From left to right they are the minimize, maximize and close button. These buttons appear as the following on every window.

Menu Bar:

The menu bar is a horizontal bar the length of the window. It appears at the top of a program window, directly beneath the title bar. The menu bar lists all menus for the program.

Work Area:

Every window has a work area. What you do in the work area depends on the window. Generally, a window's work area holds information. For example, a program window work area holds the Document window.

Icons:

Icons are small, graphic representation of program, drives, folders and documents. When you activate an icon you start the program, open the document, or access the contents of the drive or folders. By default, the Recycle Bin icon is located on your desktop.

Scroll Bar:

A scroll bar is a bar along the right edge and/or bottom edge of a window that lets you scroll contents of a window or list box to show information not currently visible on the screen.

Status Bar:

The status bar is a horizontal bar beneath a document window. It lists status information such as page number, date, time or status of task.

The Start Menu

The start menu is the main navigational tool for launching programs. It also provides access to some system settings. The start menu is located in the bottom left hand corner of the screen.

The Programs Menu:

The programs menu item displays a hierarchical menu of program groups, such as Accessories and start up. To open a program, select the menu item for the appropriate group from the Program Menu. A menu of the objects in the group appears. To start the application, select its menu item.

The Document Menu:

The start menu contains a Documents menu that gives you quick access to documents with which you have recently worked. If later you want to open the document just choose Start /

Document and choose the document from the menu. The documents menu keeps track of the last 15 documents you opened.

The Setting Menu:

The setting menu gives you access to the Control Panel, Printers folder and taskbar. Choosing the Control Panel item in the setting menu opens the Control Panel. Another way you can open the control panel is to open the My Computer folder and choose the Control Panel folder. Choosing the Printers menu item in the setting menu opens the Printers folder. The Printers folder contains icons for each of the printers available to your PC. You can open the Printers folder from My Computer as well. Choosing the Taskbar & Start Menu item in the setting menu opens a dialog box you can to customize the Start menu and Taskbar.

The Search Menu:

The search menu item in the start menu enables you to search for files on your PC or on the network, for computer on the network, the Microsoft Network online service for topics, and the internet Applications such as Microsoft Outlook and their own items to the search menu.

The Run Menu:

A command line interface for advanced users.

Shutdown:

Gives a user the option to turn off the computer, restart or logoff.

System Tray:

The system tray is located in the bottom right hand corner of the screen. The system tray holds a click and other icons for programs currently running on the system. Typically right or left clicking on these icons displays some options for interacting with the given program.

Control Panel

Add/Remove Programs:

This is the control panel to use in order to properly remove software from a computer. It is important not to just delete a program because there are other system entries that are made when a program is installed and do not get removed when a program is simply deleted.

Date/Time:

The control panel to set the date and time of the computer.

Keyboard:

The control panel for keyboard settings such as the rate the cursor blinks when typing.

Mouse:

The control panel for mouse settings such as double clicks speed. This control panel may be different for each machine depending on the type of mouse.

Creating your Own Folders

- You can create your own folders.
- Right-click in the object where you want to create the new folder.
- Choose New Folder from the resulting menu. Windows XP creates a new folder with the name New Folder.
- Select the folder and click on its name to highlight the text. Enter the name you want for the folder.

The Accessories Group

Working with Notepad:

Notepad is a bare-bones text editor that's easy to use, although it includes few of the features found in a word-processing program. Notepad adds no formatting that might modify configuration file. So it's the perfect tool for viewing and editing text files such as those with extensions like .ini, .bat, or .sys.

Notepad is the completely integrated into windows XP. You can write messages in color and post them to the Microsoft Network so recipients see your messages just as you.

To open Notepad:

- Click the Start button
- Select Program > Accessories > Notepad.

Using the Calculator:

There are two types of calculator in Windows XP a standard calculator, and a scientific calculator that does advanced mathematical functions.

To start standard calculator

- Click the Start button in the taskbar.
- Select Programs > Accessories > Calculator.

Using WordPad:

WordPad is a very simple worked-processing program. It's good deal more elaborate that Notepad but still falls in the category of "pretty basic".

NICS



ALWAYS AHEAD

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