GOVERNMENT ARTS COLLEGE FOR WOMEN, SALEM – 8
DEPARTMENT OF COMMERCE
INFORMATION TECHNOLOGY IN BUSINESS
III-B.COM

UNIT — I

Introduction to computers - Characteristics of Computer - Classification of Computer - User of Computer - Components of a Computer - Input Devices - Output Devices.

UNIT – II

Computer Main Memory - Auxiliary Storage Devices- Computer Software Classification of Software-Opening System-Functions and Classification-Programming Languages.

UNIT – III

Data Processing - Database Management System - Components of DBMS - Types of DBMS-Function of DBMS - Computer Networks -Types of Network - Network Topology.

UNIT – IV

Internet Access - Internet Protocol - Internet Addressing - WWW- Internet Relay Chat- Electronic mail - Mailing Basics-E-Mail Ethics - Introduction to multimedia - Multimedia tools.

UNIT – V

Electronic commerce - Classification of Ecommerce - System analysis and Design - Life Cycle - Mobile Commerce-Business on the Internet.

TEXT BOOKS:

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UNIT - 1

INTRODUCTION TO COMPUTERS

INTRODUCTION

A computer is a programmable machine. The two principal characteristics of a computer are:

- ✔ It responds to a specific set of instructions in a well-defined manner.
- ✔ It can execute a prerecorded list of instructions (a program).

Modern computers are electronic and digital. The actual machinery – wires, transistors, and circuits – is called hardware. The instructions and data are called software.

HARDWARE COMPONENTS

- ➤ **Central processing unit (CPU)** The **"heart"** of the computer, the component that actually executes instructions.
- ➤ **Memory** enables a computer to store, at least temporarily, data and programs.
- ➤ **Input device** Usually a keyboard or mouse, the input device is the conduit through which data and instructions enter a computer.
- ➤ **Output device** A display screen, printer, or other such devices that lets you see what the computer has accomplished.
- ➤ **Mass storage device** Allows a computer to permanently retain large amounts of data. Common mass storage devices include disk drives and tape drives.

TYPES OF COMPUTERS

- ➤ **Personal computer** A small, single-user computer based on a microprocessor.

In addition to the microprocessor, a personal computer has a keyboard for entering data, a monitor for displaying information, and a storage device for saving data.

- **Workstation** A powerful, single-user computer. A workstation is like a personal computer, but it has a more powerful microprocessor and a higher –quality monitor.
- **Minicomputer** A multi-user computer capable of supporting 10 to hundreds of users simultaneously.
- **Mainframe** A powerful multi-user computer capable of supporting many hundreds of users simultaneously.
- **Supercomputer** An extremely fast computer that can perform hundreds of millions of instructions per second.

CHARACTERISTICS OF COMPUTERS

Word length

A digital computer operates on binary digits-0 and 1. It can understand information only in terms of 0s and 1s . A binary digit is called a bit. A group of 8 bits is called a byte. The number of bits that a computer can process at a time in parallel is called its word length. Commonly used word lengths are 8, 16, 32 or 64 bits.

Speed

Computer can calculate at very high speeds. A microcomputer, for example, can execute millions of instructions per second over and over again without any mistake. As the power of the computer increases, the speed also increases.

Storage

Computers have their main memory and auxiliary memory systems. A computer can store a large amount of data. With more and more auxiliary storage devices, which are capable of storing huge amounts of data, the storage capacity of a computer is virtually unlimited.

Accuracy

The accuracy of a computer system is very high. Errors in hardware can occur, but error detecting and correcting techniques will prevent false results. In most cases, the errors are due to the human factor rather than the technological flaws. For example, if a program is wrongly coded, if the data is corrupted, or if the program logic is flawed, then irrespective on which computer you run it, you will always get wrong results.

Versatility

Computers are very versatile machines. They can perform activities ranging from simple calculations to performing complex CAD modeling and simulation to navigating missiles and satellites. In other words, they are capable of performing almost any task, provided the task can be reduced to a series of logical steps.

Automation

The level of automation achieved in a computer is phenomenal. It is not a simple calculator where you have to punch in the numbers and press the 'equal to' sign to get the result. Once a task in initiated, computers can proceed on its own till its completion. Computers can be programmed to perform a series of complex tasks involving multiple programs.

Diligence

Diligence means being constant and earnest in effort and application. Human being suffer from weakness like tiredness, lack of concentration, etc. Humans have feelings they become sad, depressed, bored, and negligent and it will reflect on the work they do. After sometime, people will become bored and tedium will set in. This will affect the performance. Being a machine, a computer does not have any of these human weaknesses. They won't tired or bored.

IMPORTANCE OF COMPUTERS

- Computers provide new time dimensions for the working day and for the human concept.
- They provide efficient and effective controls over human error.

- They provide large capacities to store information, and the capability to rapidly access this information.
- They can perform complex and repetitive calculations rapidly and accurately.
- They can hold a program of a model, which can be explored, in May different areas.
- They can correct and modify certain parameters automatically.
- They can provide meaningful information to the user and are able to draw and paint graphs.

CLASSIFCATION OF COMPUTER

A computer is an electronic machine, operating under the control instructions stored inside its memory. As an aid in problem solving, it accept data, both numeric and non-numeric, processes and presents it in the desired form.

Computers may be classified according to the principles of operators, purpose and on the basis of their size and speed.

CLASSIFICATION OF COMPUTER SYSTEM

- **Microcomputers**
- **Minicomputers**
- **Mainframes**
- **Supercomputers.**

MICROCOMPUTERS

The most familiar kind of computer is the microcomputer. Because of its small size and the use of micro-processor, this computer is called micro computer. All the

computers have three units namely Input, Output and Central Processing Unit (CPU).

Two Types of Micro Computers are

- ✔ Personal Computers
- ✔ Workstations.

Personal Computer (PCs)

Personal Computers were desktop or portable machines. These machines ran comparatively easy-to-use applications software such as the word processors, spreadsheets, etc. They had less sophisticated video display screens, operating systems and networking capabilities. Most important, they did not have the processing power that workstations did. Examples : Acer's Aspire, Compaq Presario, etc.

Workstations

Workstations are, again, until recently, expensive, Powerful machines used by engineers, scientists, and other professionals who processed a lot of data. People who need to run complex programs and display both work in progress and results graphically also use workstations.

Workstations use sophisticated display screens featuring high-resolution colour graphics and operating systems such as UNIX that permitted multitasking. Workstations also use powerful networking links to other computers. Example : Sun, Apollo, Hewlett-Packard, NeXT and IBM.

Advantages for Microcomputer:

- ✔ They are small and portable.
- ✔ They are relatively inexpensive.
- ✔ They work as soon as they are switched on.
- ✔ They do not occupy much space.
- ✔ They do not consume much power.

Disadvantages for Microcomputer:

- ✔ Micros have a limited storage capacity.
- ✔ They are relatively slow.

Portable computer:

One type of that PC that is rapidly growing in popularity is the portable computer,which can be easily carried around. There are three categories of portable computers

Laptops or notebook PCs

Subnotebooks

Personal Digital Assistants.

Laptops or notebook PCs:

Laptops may be either AC-powered, battery-powered, or both. This computers are ideal for uses who have to work away from their offices.

The user of this computers might be an executive on the move, a student, a journalist, a sales person, etc. This computers combine the power of the PC with mobility. An example is IBM ThinkPad.

Subnotebooks:

Subnotebooks users give up a full display screen and keyboard in exchange for less weight

Personal Digital Assistants:

PDAs are much smaller than subnotebooks. They combine pen input ,writing recognition, personal organizational tools, and communication capabilities in a very small package.

MINICOMPUTERS

The size of the mini computer is in between the size of micro and mainframe computers. It is more powerful than micro computer. Mini computers are usually

designed to serve multiple users. Today, mini computers are the popular data processing systems in the fields of business and industry. This computers accept all high level languages.

Advantages for Minicomputer:

- ✔ It performs almost all the tasks that a mainframe computers do.
- ✔ It is relatively inexpensive and is within the purchasing power of the small and medium sized business firms.

Disadvantages for Minicomputer:

- ✔ They are slower when comparing with mainframe computers.
- ✔ The memory of mini computers are smaller to the mainframe computers.

MAINFRAME COMPUERS

This computers are huge and dynamic with action. They occupy a large space. Its transfer rate is very high. The word lengths are higher than the other computers. This computers are able to accept any high level language. A mainframe computer can support more number of terminals. Hence, it is also called as a " Central Host Computer". Mainframe are mainly used by insurance companies, banks, airline and railway reservation systems, etc.

Advantages for Mainframe computer:

- ✔ They are capable of handling all tasks.
- ✔ The transfer rate is very high i.e., millions of bytes per seconds.
- ✔ The word lengths are either 24, 32, 48, 64 or 128 bits.
- ✔ They are able to accept any high level language.
- ✔ It can support around 500 terminals

Disadvantages for Mainframe computer:

- ✔ They are very expensive .
- ✔ They require large room space.
- ✔ Their consumption of electricity is very high.
- ✔ Maintenance cost is also very high.

SUPER COMPUTERS

The super computer are very costly. Hence, it is rarely used. Its capacity is abnormally high. IT cannot be compared with any other computers in capacity, functions, speed, accuracy, language, etc. They have operations done in parallel, rather than sequential. Its main memory ranges from 8 to 64 megabytes. Most super computers are used by government agencies.

NETWORK COMPUTERS

Network computers are computers with minimal memory, disk storage and processor power designed to connect to a network, especially they internet.

The idea behind network computers is that many users who are connected to a network don't need all the computer power they get from a typical personal computer. A network computers has from 4 to 64 MB of RAM, an 8 MB ROM card, a Smart card slot, Infrared and network interfaces, a parallel port, and a pair of PS/2- compatible I/O ports.

USE OF COMPUTER

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

Business

A computer has high speed of calculation, diligence, accuracy, reliability, or versatility which made it an integrated part in all business organisations.

Computer is used in business organisations 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 provide online 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 procedure 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 computer provides a tool in the education system known as
- CBE *ComputerBasedEducation*. CBE involves control, delivery, and evaluation of learning.
- The computer education is rapidly increasing the graph of number of computer students.
- There are number of methods in which educational institutions can use computer to educate the students.
- It is used to prepare a database about performance of a student and analysis is carried out on this basis.

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 computerised 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 hospitals, labs, and dispensaries. 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 computerised machines.

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

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's side effects etc.

Surgery : Nowadays, computers are also used in performing surgery.

Engineering Design

Computers are widely used in Engineering purpose.

One of major areas is CAD *Computeraideddesign*. That provides creation and modification of images. Some fields are:

Structural Engineering - Requires stress and strain analysis 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. Military also employs

computerised 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 for. Some main areas in this category are:

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

COMPONENTS OF A COMPUTER

The computer needs both Hardware and Software. Hardware Consists of the mechanical and electronic devices, which we can see and touch. The Software consists of programs, the operating systems and the data that reside in the memory and storage devices.

FUNCTIONS OF A COMPUTERS

- ❖ Receive input
- ❖ Process information
- ❖ Produce output
- ❖ Store information

Receive Input:

Accept information from outside through various input devices like the keyboard, mouse,etc.

Process information:

Perform arithmetic or logical operation on the information.

Produce output:

Communicate information to the outside world through output devices like monitor, printer, etc.

Store Information:

Store the information in storage devices like hard disk, floppy disks etc.

CENTRAL PROCESSING UNIT (CPU)

The part of the computer that executes program instructions is known as the processor or central processing unit (CPU). In a micro computer, the CPU is on a single electronic component, the microprocessor chip, within the system unit or system cabinet. The system unit also includes circuit boards, memory chips, ports and other components. A Microcomputer's system cabinet will also house disk drives, hard disks, etc.

The CPU has two parts are,

- ✔ Control Unit
- ✔ Arithmetic-Logic Unit(ALU).

Control Unit

The control unit tells the rest of the computer system how to carry out a program's instruction. It directs the movement of electronic signals between memory- which temporarily holds data, instructions and processed information- and the ALU.

Arithmetic-Logic Unit (ALU)

Arithmetic-Logic Unit, usually called the ALU, performs two types of operation- Arithmetic and Logical. Arithmetic operations are the fundamental mathematical operations consisting of addition, subtraction, multiplication and division. Logical operation consist of comparison. That is two pieces of data are compared to see whether one is equal to, less than, or greater than the other.

MEMORY

Memory- also known as the primary storage or main memory – is a part of the micro computer that holds data for processing, instruction for processing the data (the program) and information (Processed data).

Part of the contents of the memory is held only temporarily, that is, it is stored only as long as the micro computer is turned on. When you turned the machine off, the contents are lost. The capacity of the memory to hold data and program instructions various in different computers.

Registers

Computers also have several additional storage locations called registers.

Addresses

To locate the characters of data or instructions in the main memory, the computer stores them in locations known as addresses.

HOW THE CPU AND MEMORY WORK

1. The control unit recognizes that the program has been loaded into memory. It begins to execute the first step in the program.
2. The program tells the user, " Enter 1st Number".
3. The user types the number 10 on the keyboard. An electronic signal is send to the CPU.
4. The control unit recognizes this signal and routes the signal to an address in memory – address 7.
5. After completing the above instruction, the next instruction tells user, " Enter 2nd Number".
6. The user types the number 4 on the keyboard. An electronic signal is send to the CPU.
7. The control unit recognizes this signal and routes it to memory address 8.
8. The next program instruction is executed – "Multiply 1st and 2nd Numbers".

9. To execute this instruction, the control unit in forms the ALU the two numbers are coming and the ALU is to multiply them. The control unit next sends to the ALU a copy of the contents of address 7(10) and address 8(4).
10. ALU performs the multiplication: 10 x 4 = 40.
11. The control unit sends a copy of the multiplied result (40) back to memory, to address 9.
12. The next program instruction is executed : "Print the result".
13. To execute this instruction, the control unit sends the contents of the address 9(40) to the monitor.
14. Monitor displays the value 40.
15. Final instruction is executed : " End". The program is complete.

MEMORY UNITS

INRODUCTION

Memory units are the internal storage areas in a computer. The term " Memory" identifies data storage that comes in the form of chips, and the word (Storage) is used for memory that exists on tapes or disks. Some computers also use virtual memory, which expands physical memory onto a hard disk. A computer that has 1 megabyte of memory, therefore, can hold about 1 million bytes (or characters) of information.

TYPES OF MEMORY

- RAM (Random - Access Memory)
- ROM (Read-Only Memory)
- PROM (Programmable Read-Only Memory)
- EPROM (Erasable Programmable Read-Only Memory)
- EEPROM(Electrically Erasable Programmable Read-Only Memory)

INPUT DEVICES

INTRODUCTION

An input device is any machine that feeds data into a computer. For examples, a keyboard is an input devices, whereas a display monitor is an output devices. Input devices other than the keyboard are sometimes called alternate input devices. Mice, trackballs, and light pens are all alternate input devices.

KEYBOARD

Keyboard is an input device consisting of a set of typewriter- like keys that enable you to enter data into a computer. Computer keyboards are similar to electric-typewriter keyboards but contain additional keys.

The keys on computer keyboards are often classified as follows:

- Alphanumeric keys – letters and numbers.
- Punctuation keys – comma, period, semicolon, and so on.
- Special keys – function keys, control keys, arrow keys, Caps Lock key, and so on.

There are actually three different PC keyboards:

- Original PC keyboard 84 keys.
- AT keyboard 84 keys
- Enhanced keyboard 101 keys.

The three differ function keys are:

- Control key
- Return key
- Shift key

In addition to these keys, IBM keyboards contain the following keys:

- Page UP
- Page Down
- Home
- End
- Insert
- Pause
- Num
- Lock
- Scroll Lock
- Break
- Caps Lock
- Print Screen

MOUSE

Mouse is a device that controls the movement of the cursor or pointer on a display screen. A mouse is a small object you can roll along a hard, flats surface. The mouse is also useful for graphics programs that allow you to draw pictures by using the mouse like a pen, pencil or paint brush.

Types Of Mouse

- ✔ Mechanical
- ✔ Optomechanical
- ✔ Optical

Mechanical

Mechanical has a rubber or metal ball on its underside that can roll in all directions.

Optomechnacial

Optomechanical same as a mechanical mouse, but uses optical sensors to detect motion of the ball.

Optical

Optical uses a laser to detect the mouse's movement. You must move the mouse along a special mat with a grid so that the optical mechanism has a frame of reference.

Connections

Mouse connect to PCs in one of three ways:

- Serial mouse connect directly to an RS- 232C serial port or a PS/2 port. This is the simplest type of connection
- Bus mouse connect to the bus through an interface card. This is some what more complicated because you need to configure and install an expansion board.
- Cordless mouse aren't physically connected at all. Instead they rely on infrared or radio waves to communicate with the computer.

Mouse pad

Mouse pad is a pad over which you can move a mouse. Mouse pads provide more traction than smooth surfaces such as glass and wood, so they make it easier to move a mouse accurately. For mechanical mice, mouse pads are optical. Optical mice, however, require special mouse pads that have grids drawn on them.

TRACKBALL

Trackball is another pointing device. Essentially, a trackball is a mouse lying on its back. To move the pointer, you rotate the ball with your thumb, your fingers, or the palm of your hand. There are usually one to three buttons next to the ball, which you use just like mouse buttons. The advantage of track balls over mice is that the track ball is stationary so it does not require much space to use it.

JOYSTICK

A lever that moves in all directions and controls the movement of a pointer or some other display symbols. A joystick is similar to a mouse, except that which a mouse the cursor stops moving as soon as you stop moving the mouse. With a joystick, the pointer continues moving in the direction the joystick is pointing.

DIGITIZING TABLET

This is an input device that enables you to enter drawings and sketches into a computer. A digitizing tablet consist of an electronic tablet and a cursor or pen. A cursor is similar to a mouse, except that it has a window with cross hairs for pinpoint placement, and it can have as many as 16 buttons. A pen which looks like a simple ball point pen but uses an electronic head instead of ink.

SCANNERS

Scanner is an input device that can read text or illustrations printed on paper and translate the information into a form that the computer can use. A scanner works by digitizing an image – dividing it into a grid of boxes and representing each box with either a zero or a one, depending on whether the box is filled in.

Scanner differ from one another in the following respects:

- **Scanning technology** Most scanners use charge – couple device (CCD) arrays, which consist of tightly packed rows of light receptors that can detect variations in light intensity and frequency.
- **Resolution** The denser the bit map, the higher resolution. Typically, scanner support resolution from 72 to 600 dots per inch(dpi).
- **Bit depth** The number of bits used to represent each pixel. The greater the bit depth, the more colors or grayscales can be represented.
- **Size and Shape** Some scanners are small hand-held devices that you move across the paper. These hand-held scanners are often called half-page scanners because they can only scan 2 to 5 inches at a time.

DIGITAL CAMERA

Images can be input into a computer using a digital camera. These images can then be manipulated in many ways using the various imaging tools available. The digital camera takes a still photograph, stores it, and then sends it as digital input into the computer. The images are then stored as digital files.

MAGNETIC INK CHARACTER RECOGNITION (MICR)

MICR allows the computer to recognize characters printed using magnetic ink. MICR is a direct-entry method used in banks. This technology is used to automatically read those frustrating-looking numbers on the bottom of the cheque. A special- purpose machine known as a reader/sorter reads characters made of ink containing magnetized particles.

OPTICAL CHARACTER RECOGNITION (OCR)

The optical character recognition refers to the branch of computer science that involves reading text from paper and translating the images into a form that the computer can manipulate (Eg: ASCII codes). An OCR system enables you to take a book or a magazine article and feed it directly into an electronic computer file.

All OCR system include an optical scanner for reading text, and sophisticated software for analyzing images. Most OCR systems use a combinations of hardware and software to recognize characters, although some inexpensive systems do it entirely through software.

OPTICAL MARK RECOGNITION (OMR)

OMR also called mark sensing is a technology where an OMR device senses the presence or absence of a mark, such as a pencil mark. OMR is used in tests such as aptitude tests.

BAR CODE READER

You are probably familiar with the bar code readers in super markets, bookshops, etc. Bar-code readers are photo electric scanners that read the bar codes, or vertical zebra striped marks, printed on product containers. Super markets use a bar code systems called the Universal Product Code(UPC). The bard code identies the product to the super market's computer, which has a description and the latest price of the product.

SPEECH INPUT DEVICES

Speech or voice input devices convert a person's speech into digital form. These input devices , when combined with appropriate software, form voice recognition systems. These systems enable users to operate micro computers using voice commands.

There are two types of voice recognition systems:

- **Continuous Speech** It recognition system are used to control a microcomputer's operations and to issue commands to special application programs. Two popular systems are Apple Computer's Plain Talk and IBM's Continuous speech series.
- **Discrete-Word** A common activity in business is preparing memos and other written documents. It recognition systems allow user to dictate directly into a micro computer using a micro phone. IBM Voice Type Simply Speaking is an example.

TOUCH SCREEN

Touch screen is a type of display screen that has a touch- sensitive transparent panel covering the screen. Instead of using a pointing device such as a mouse or light pen, you can use your finger to point directly to objects on the screen.

TOUCH PAD

A small, touch-sensitive pad used as appointing device on some portable computers. By moving a finger or other object along the pad, you can move the pointer on the display screen.

LIGHT PEN

Light pen is an input device that utilizes a light - sensitive detector to select objects on a display screen. A light pen is similar to a mouse, except that with a light pen you can move the pointer and select objects on the display screen by directly pointing to the objects with the pen.

OUTPUT DEVICES

INTRODUCTION

Output is anything that comes out of a computer. Output can be meaningful information or gibberish, and it can appear in a variety of forms – as binary numbers, as characters, as pictures, and as printed pages.

MONITOR

Monitor is another term for the display screen. The term monitor, however, usually refers to the entire box, whereas display screen can mean just the screen.

CLASSIFICATION OF MONITORS – BASED ON COLOUR

- **Monochrome** monitors actually display two colours, one for the background and one for the foreground. The colours can be black and white, green and black, or amber and black.
- **Gray – Scale** monitor is a special type of monochrome monitor capable of displaying different shades of gray.
- **Colour** monitors can display anywhere from 16 to over 1 million different colours. Colour monitors are sometimes called RGB monitors because they accept three separate signals – red, green, and blue.

CLASSIFICATION OF MONITORS – BASED ON SIGNALS

- **Digital Monitor** accepts digital signals rather than analog signals. All monitors use CRT technology, which is essentially analog. The term digital refers only to the type of input received from the video adapter. Consequence, only low-quality video standards, such as MDA(Monochrome Display Adapter), CGA(Colour/Graphics Adapter), and EGA(Enhanced Graphics Adapter), specify

digital signals.

- **Analog Monitor** This is the traditional type of colour display screen that has been used for years in televisions. In reality, all monitors based on CRT Technology are analog. Some monitors, however, are called digital monitors because they accept digital signals from the video adapter.

CHARACTERISTICS OF A MONITOR

- **Size** The most important aspect of a monitor is its screen size. Like televisions, screen sizes are measured in diagonal inches, the distance from one corner to the opposite corner diagonally. A typical size for small VGA monitors is 14 inches. Monitors that are 16 or more inches diagonally are often called full-page monitors.
- **Resolution** of a monitor indicates how densely the pixels are packed. Pixels is short for picture element. A pixel is a single point in a graphic image. Graphics monitor display picture by dividing the display screen into thousands(or millions) of pixels, arranged in rows and columns.
- **Bandwidth** The amount of data that can be transmitted in a fixed amount of time. For digital devices, the bandwidth is usually expressed in bits or bytes per second (bps). For analog devices, the bandwidth is expressed in cycles per second, or Hertz (Hz).
- **Refresh Rate** Display monitors mustbe refreshed many times per second. The refresh rate determines how many times per second the screen is to be refreshed (redrawn). The refresh rate for a monitor is measured in hertz (Hz) and is also called the vertical frequency or vertical refresh rate.
- **Interlaced or Non – interlaced** Interlacing is a display technique that enables a monitor to provide more resolution inexpensively. With interlocking monitor, the electron guns draw only half the horizontal lines with each pass.
- **Dot – pitch** A measurement that indicates the vertical distance between each pixel on a display screen. Measured in millimeters, the dot-pitch is one of the principal characteristics the determine the quality of display monitors.

- **Convergence** refers to how sharply an individual colour pixel on a monitor appears. Each pixel is composed of three dots- a red, blue and green one. If the dots are badly misconverged, the pixel will appear blurry. All monitors have some convergence errors, but they defer in degree.

VIDEO STANDARDS

There are a variety standards that defined resolution and colours for displays. Support for a graphics standard is determined by both the monitor and the video adapter. The monitor must be able to show the resolution and colours defined by the standard, and the video adapter must be capable of transmitting the appropriate signals to the monitors.

POPULAR VIDEO STANDARD FOR PCs

VGA

Abbreviation of video graphics array, a graphics display system for PCs developed by IBM. VGA has become one of the de facto standards for PCs. In text mode, VGA systems provide a resolution of 720 by 400 pixels. In graphics mode, the resolution is either 640 by 480 (with 16 colours), or 320 b 200 (with 256 colours). The total palette of colours is 262,144.

SVGA

Short for Super VGA, a set off graphics standards designed to offer greater resolution than VGA.

There are several varieties of SVGA, each providing a different resolution:

- 800 by 600 pixels
- 1024 by 768 pixels
- 1280 by 1024 pixels
- 1600 by 1200 pixels.

The SVGA standards are developed by a consortium of monitor and graphical

manufacturers called VESA(Video Electronics Standards Association).

8514/A

A high-resolution video standard for PCs developed by IBM in 1987. It was designed to extent the capabilities of VGA. The 8514/A standard provides a resolution of 1,024 by 768 pixels, which gives it about 2.5 times the pixels of VGA (640 by 480). Like VGA, 8514/A provides a palette of 262,000 colours, of which 256 can be displayed at one time. In its original version, 8514/A relies on interlacing, a techniques that makes it possible to provide resolution at low cost.

XGA

Short for extended graphics array, a high-resolution graphics standard introduced by IBM in 1990.XGA was designed to replace the older 8514/A video standard .It provides the same resolutions (640 by 480 or 1024 by 768 pixels),but supports more simultaneous colours (65 thousand compared to 8514/A's 256 colours).In addition, XGA allows monitors to be non-interlaced.

TI 34010

TI 34010 is a video standard from Texas Instruments that supports a resolution of 1,024 by 768.TI 34010 conforms to TI's Graphics Architecture (TIGA).Unlike IBM'S 8514/a , which supports the resolution, TI 34010 is non-interlaced.

PRINTER

Printer is a device that prints text or illustrations on paper and in many cases on transparencies and other media. There are many different types of printers .In terms of the technology utilized, printers fall into the following categories.

Daisy-wheel Printer

Daisy-Wheel Printers are a type of printer that produces letter-quality type. A daisy-wheel printer works on the same principle as a ball-head typewriter. The daisy wheel is a disk made of plastic or metal on which characters stand out in relief along the outer edge.

Dot-Matrix Printer

Dot-matrix printers create characters by stricking pins against an ink ribbon. Each pin makes a dot, and combinations of dots form characters and illustrations. Dot-matrix printers are inexpensive and relatively fast, but they do not produce high-quality outpur. Dot-matrix printers vary in two important characteristics : **Speed** and **Print quality.**

Ink-Jet Printer

Ink-jet printers work by spraying ionized ink at a sheet of paper. Magnetizied plates in the ink's path direct the ink onto the paper in the desired shapes. Ink-jet printers are capable of producing high quality print approaching that produced by laser printers.

Laser Printer

Laser Printer utilizes a laser beam to produce an image on a drum. The light of the laser alters the electrical charge on the drum wherever it hits. The drum is then rolled through a reservoir of toner, which is picked up by the charged portions of the drum. Finally, the toner is transferred to the paper through a combination of heat and pressure.

This is also the way copy machines work. Most laser printers come with a basic set of fonts, called internal or resident fonts, but you can add additional fonts in one of two ways: **Font cartridges, Soft fonts.**

LCD & LED Printers

Similar to a laser printer but uses liquid crystals or light-emitting diodes rather than a laser to produce an image on the drum.

Line Printer

Line Printer are high-speed printers capable of printing an entire line at one time. A fast line printer can print as many as 3,000 lines per minute. The disadvantages of line printers are that they can print only one font, they cannot print graphics, the print quality is low, and they are very noisy.

Thermal Printer

Thermal printers are printers that produce images by pushing electrically heated pins against special heat-sensitive paper. Thermal printers are inexpensive and are used in most calculators and many fax machines.

Printers are also classified according to the following characteristics:

- ✔ Quality of type
- ✔ Speed
- ✔ Impact or non-impact
- ✔ Graphics
- ✔ Fonts.

PLOTTER

Plotter is a device that draws pictures on paper based on commands from a computer. Plotters differ from printers in that they draw lines using a pen. As a result, they can produce continuous lines, whereas printers can only simulate lines by printing a closely spaced series of dots. Multicolour plotters use different-coloured pens to draw different colours.

SOUND CARDS & SPEAKERS

An expansion board that enables a computer to manipulate and output sounds. Sound cards are necessary for nearly all CD-ROMs and have become commonplace on modern personal computers.

Sound cards use two basic methods to translate digital data into analog sounds.

- ➤ **FM (Frequency Modulation)** Synthesis mimics different musical instruments according to built-in formulas.
- ➤ **Wavetable** Synthesis relies on recordings of actual instruments to produce sound. Wavetable synthesis produce more accurate sound, but is also more expensive.

3D – AUDIO

3D audio is a technique for giving more depth to traditional stereo sound. Typically, 3D sound, or 3D audio, is produced by placing a device in a room with stereo speakers. The device dynamically analyses the sound coming from the speakers and sends feedback to the sound system. So that it can readjust the sound to give the impression that the speakers are further apart.

UNIT-1

2marks:

1. Define Computer.
2. List out the hardware components.
3. What are the types of computer?
4. What are characteristics of computer?
5. Define Diligence.
6. Define Micro computer.
7. Define Super computer.
8. What is Network computer?
9. Define CPU.
10. What is ALU? Explain.

11. What is registers and addresses?
12. Define DAT cartridge.

5marks:

1. Explain in briefly about types of memory.
2. Explain in briefly about characteristics of computer.
3. Explain in briefly about classification of computer.
4. Write about the functions of computer.
5. Discuss about CPU.
6. Give a short notes on Memory.

10marks

1. Explain in detail about the auxiliary storage devices.
2. Explain in detail about Input devices.
3. Explain in detail about Output devices.

UNIT-2

Computer Main Memory

The main memory in a computer is called Random Access Memory. It is also known as RAM. This is the part of the computer that stores operating system software, software applications and other information for the central processing unit (CPU) to have fast and direct access when needed to perform tasks. It is called "random access" because the CPU can go directly to any section of main memory, and does not have go about the process in a sequential order.

Primary Memory (Main Memory) :

Primary memory holds only those data and instructions on which the computer is currently working. It has a limited capacity and data is 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 instruction required to be processed resides in the main memory. It is divided into two subcategories RAM and ROM.

TYPES OF MEMORY

- RAM (Random - Access Memory)
- ROM (Read-Only Memory)
- PROM (Programmable Read-Only Memory)
- EPROM (Erasable Programmable Read-Only Memory)
- EEPROM(Electrically Erasable Programmable Read-Only Memory)

RAM (Random-Access Memory)

This is the same as the main memory. When used by itself, the term RAM refers to read and write memory; that is, you can both write data into RAM and read data from RAM. This is in contrast to ROM, which permits you only to read data.

There are two types are

- ✔ Dynamic RAM (DRAM) – It needs to be refreshed thousands of times per second.

✔ Static RAM (SRAM) – It needs to be refreshed less often, which makes it faster.

ROM (Read-Only Memory)

Computers almost always contain a small amount of read-only memory that hold instruction for starting up the computer. Unlike RAM, ROM cannot be written to.

Most personal computers contain a small amount of ROM that stores critical programs such as the program that boots the computer. ROMs are used extensively in calculators and peripheral devices such as laser printers, whose fonds are often stored in ROMs.

PROM (Programmable Read-Only Memory)

A PROM is a memory chip on which you can store a program. But once the PROM has been used, you cannot wipe it clean and use it to store something else. Like ROMs, PROMs are non-volatile. A PROM is a memory chip on which data can be written only once. Once a program has been written onto a PROM, It remains there forever. Unlike the main memory, PROMs retain their contents when the computer is turned of.

EPROM (Erasable Programmable Read-Only Memory)

An EPROM is a special type of PROM that can be erased by exposing it to ultra violet light. An EPROM differs from a PROM in that a PROM can be written to only once and cannot be erased.

A PROMs are used widely in personal computers because the enable the manufacture to change the contents of the PROM before the computer is actually shipped.

EEPROM (Electrically Erasable Programmable Read-Only Memory)

An EEPROM is a special type of PROM that can be erased by exposing it to an electrical charge. Like all other types of ROM, EEPROM is not as fast as RAM. EEPROM is similar to flash memory (sometimes called flash EEPROM).

FLASH MEMORY

Flash memory is a special type of EEPROM that can be erased and reprogrammed in blocks instead of 1 byte at a time. Many modern PCs have their BIOS (Basic Input

Output System) Stored on a flash memory chip so that it can easily be updated if necessary. Such a BIOS is sometimes called a flash BIOS.

Auxiliary Storage Devices:

Auxiliary storage, secondary storage, or external storage are devices that store noncritical system data like documents, multimedia and programs, which are used whenever they are required. ... Other auxiliary storage belongs to the peripheral devices category as well, such as flash drives and any type of memory card.

AUXILIARY STORAGE DEVICES

INTRODUCTION

Auxiliary storage also known as auxiliary memory or secondary storage, is the memor that supplements the main storage. This is a long-term, non-volatile memoey. The term non-volatile means it stores and retains the programs and data even after the computer is switched off.

Auxiliary storage devices are also useful in transferring data or programs from one computer to another. The most common types of auxiliary storage devices are magnetic tapes, magnetic disks, floppy disks, hard disks, etc.

There are two types of auxiliary storage devices. This classification is based on the type of data access: sequential and random. Based on the type of access they are called sequential-access media and random-media. Magnetic tapes are examples of sequential-access media. In contrast random-access also called direct-access media because a disk drive can access any point at random without passing through intervening points. Examples of direct-access media are magnetic disks, optical disks, zip disks, etc.

MAGNETIC TAPE

Magnetic tape is a magnetically coated strip of plastic on which data can be encoded. Tapes for computers are similar to the tapes used to store music. Some personal computers, in fact, enable you to use normal cassette tapes.

Storing data on tapes is considerably cheaper than storing data on disks. Tapes also have large storage capacities, ranging from a few hundred kilobytes to several gigabytes.

Types Of Tapes

- ✔ Half-inch : 60MB - 400MB
- ✔ Quarter : 40MB – 5GB
- ✔ 8 –mm Helical-scan : 1GB – 5GB
- ✔ 4-mm DAT : 2GB – 24GB.

Helical-Scan Cartridge

A type of magnetic tape that uses the same technology as VCR tapes. The term helical-scan usually refers 8-mm tapes, although 4-mm tapes uses the same technology. The 8-mm helical-scan tapes have data capacities from 2.5 GB to 5 GB.

DAT Cartridge

DAT(Digital Audio Tape) is a type of magnetic tape that uses an in genius scheme called helical-scan to record data. A DAT cartridge is slidely larger than a credit card and contains a magnetic tape that can hold from 2 to 24 gigabytes of data. It can support data transfer rates of about 2 MBps(Million Bytes Per Second).

WINCHESTER DISK The term Winchester comes from an early type of disk drive developed by IBM that stored 30 MB and had a 30 millisecond accesses time; so its inventors named it a Winchester in honour of the 30 caliber rifle of the same name.

HARD DISK

Hard disk is a magnetic disk on which you can store computer data. The term hard is used to distinguish it from a soft, or floppy, disk. Hard disks hold more data and are faster than floppy disks. A single hard disk usually consists of several platters. Each platter requires to read/write heads, one for each side. Each platter has the same number of tracks, and a track location that cuts across all platters is called a cylinder.

FLOPPY DISK

Floppy disk is a soft magnetic disk. It is called floppy because it flops if you wave it. Unlike most hard disks, floppy disks are portable, because you can remove them from a disk drive. Disk drives for floppy disks are called floppy drives.

Floppies come in two basic sizes:

- 5 ¼ - inch
- 3 ½ - inch

ZIP DISK

These are high capacity floppy disk drives developed by the Iomega corporation. Zip disks are slightly larger than the conversional floppy disks, and are about twice as thick. They can hold 100 MB of data.

JAZ DISK

This are removable disk drives developed by the Iomega corporation. The JAZ drive has a 12-ms average cseek time and a transfer rate of 5.5 Mbps. The removable cartridges hold 1GB of data.

SUPER DISK

This is a new disk storage technology developed by the Imation corporation that supports very high density diskettes. Super disk diskettes are etched with a servo pattern at the factory. The result is that a super disk diskette can have 2,490 tracks, as opposed to the 135 tracks that conventional 3.5 inch 1.44 MB diskettes use.

OPTICAL DISK

Optical Disks are a storage medium from which data is rad and to which it is written by lasers. Optical disks can store much more data upto 6 gigabytes than magnetic media, such as floppies and hard disks.

There are three basic types of optical disks:

- CD – ROM (Compact Disc – Read-Only Memory)
- WORM (Write-once, read-many)
- Erasable

CD – ROM

CD – ROM, which is pronounced as ' see-dee-rom ', is the abbreviation of Compact Disc – Read-Only Memory.CD-ROM is a type of optical disk capable of storing large amounts of data – up to 1 GB, although the most common size is 630 MB. A single CD-ROM has the storage capacity of 700 floppy disks, enough memory to store about 300, 000 text pages.

CD-R Drive

CD-R Drive, which is short for compact disk- recordable drive, is a type of disk drive that can create CD-ROMs and audio CDs. A feature of many CD-R Drives, called multi session recording, enables you to keep adding data to a CD-ROM over time. To create a CD-Rom and audio CDs, you'll need not only as CD-R Drive, but also a CD-R software package.

CD-RW Disks

CD-RW Disk is short for CD-Re writable disk and this is a new type of CD disk that enables you to write on to it in multiple sessions. One of the problems with CD-R disks is that you can only write to them once. With CD-RW Drive and disks, you can treat the optical disk just like a floppy or hard disk, writing data on to it multiple times.

MAGNETO-OPTICAL (MO DRIVES)

This is a type of disk drive that combines magnetic disk technologies with CD-ROM technologies. Like magnetic disks, MO disks can be read and written to. And like floppy disks, they are also removable. However, their storage capacity can be more than 200 megabytes, much greater than magnetic floppies.

COMPUTER SOFTWARE:

INTRODUCTION

A computer needs both hardware and software for its proper functioning. Anything that can be stored electronically is software. The storage devices and display devices are hardware. Software is often divided into two categories.

- **System software** – Includes the operating system and all the utilities that enable the computer to function.
- **Application software** – includes programs that do real work for users. For example, word processors, spreadsheets, and database management systems fall under the category of application software

Examples of Application software are the following –

- Payroll Software
- Student Record Software
- Inventory Management Software
- Income Tax Software
- Railways Reservation Software

Classification of Software :-

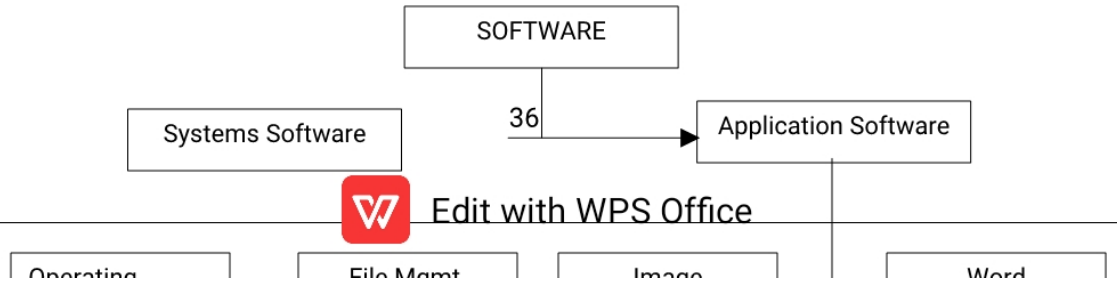


Fig Software types

An overview of these different classes of software – primarily operating systems, compilers, utilities, word processors, spreadsheets database management systems, etc.

Operating Systems

Operating systems are the most important programs that run on a computer. Every general-purpose computer must have an operating system to run other programs. Operating systems perform basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk, and controlling peripheral devices such as disk drives and printer. Most commonly used operating system includes Microsoft Windows, DOS, Xenix, Mac OS, OS/2, UNIX, MVS etc.

Compilers and interpreters:

Compiler:

It is a program that translates source code into object code.

Programs produced by compilers run much faster than the same program executed by an interpreter.

A translation program is run to convert to the programmer's on-line high-level

program, which is called the source code into a machine language code. This translation process is called **compilation.**

Widely used compiled languages are COBOL, C, C++, Fortran etc.

Interpreter:

It analyzes and executes each line of source code in succession.

The advantage of interpreters is that they can execute a program immediately.

The machine language code is called the object code and can be saved and either run immediately or later.

A translation program converts each program statement into machine code just before the program statement is to be executed. Translation or executions occur immediately, one after another, one statement at a time.

Interpreter languages do not need to state object code. So it is easy to code and test.

Word processor:

A word processor is a program that enables to perform word processing function. It use a computer to create, edit and print documents.

A word processor enables user to create a document, store it electronically on a disk, display it on a screen, modify it by entering commands and characters from the keyboard and print it on a printer.

Ex: MS-Word, WordStar, WordPerfect, AmiPro etc.

Spreadsheet:

Spreadsheet is a table of values arranged in rows and columns. Each value can have a predefined relationship to the other values.

It is often referred to as spreadsheet applications that help to create and manipulate spreadsheets electronically.

The relationships between cells are called ***formulas*** and the name of the cell is called as ***label***.

Changes made in one sheet automatically affect other spreadsheets.

Ex: Lotus 1-2-3, Excel – to produce charts and graphs

Presentation graphics:

- It enables users to create highly stylized images for slide shows and reports. The software includes functions for creating various types of charts and graphs and for inserting text in a variety of fonts.
- It is often called as business graphics.

Ex: MS-PowerPoint, Lotus Freelance Graphics, Harvard Presentation graphics.

Database management systems (DBMS):

A DBMS is a collection of programs that enable to store, modify and extract information from a database.

Example of database applications → computerized library system, Automated Teller Machine (ATM), flight and railway reservation systems computerized inventory system etc.

Requests for information from a database are made in the form of Query i.e. stylized question. Structured Query Language is a semi standardized query language.

The information from a database is presented in variety of formats such as in the form of report or in the form of graphs and charts.

Ex.: IDMS, IMS, DB2, ORACLE, SYBASE, INFORMIX, INGRESS, MS SQI SERVER, MS ACCESS

Image processors:

It enables to create, edit, manipulate, add special effects, view, print and save images.

Paint program:

It is a graphics program that enables to draw pictures on the display screen.

It is represented as bit maps.

It provides tools in the form of icons.

It also provides easy way to draw common shapes such as straight lines, rectangles, circles and ovals.

Draw program:

- ♠It is a graphics program that enables to draw pictures.
- ♠It then store the images in files, merge them into documents and print them.
- ♠It uses vector graphics that makes easy to scale images to different sizes.
- ♠This graphics can be represented at any resolution.

Image Editors:

- ♥ It provides a variety of special features for altering bitmapped images.
- ♥ It is specialized for modifying bitmapped images such as scanned photograph.

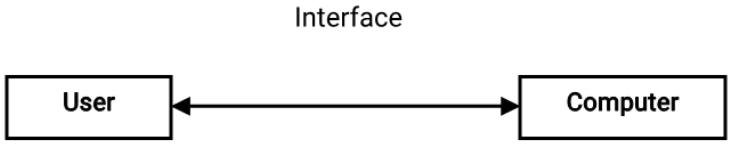
OPERATING SYSTEM

An Operating System manages and coordinates the functions performed by the computer hardware, including the CPU, input/output devices, secondary storage devices and communication and network equipment.

Definition:

It is the most important program that runs on a computer. Operating system performs basic tasks, such as recognizing input from the keyboard, sending output to the display screen, keeping track of files and directories on the disk and controlling peripheral devices such as disk drives and printers.

The OS software must keep track of each hardware resource, determines who gets what, determine when the user will have access to the resource, allocate how much of the resource the user will be given and terminate access at the end of the use period.

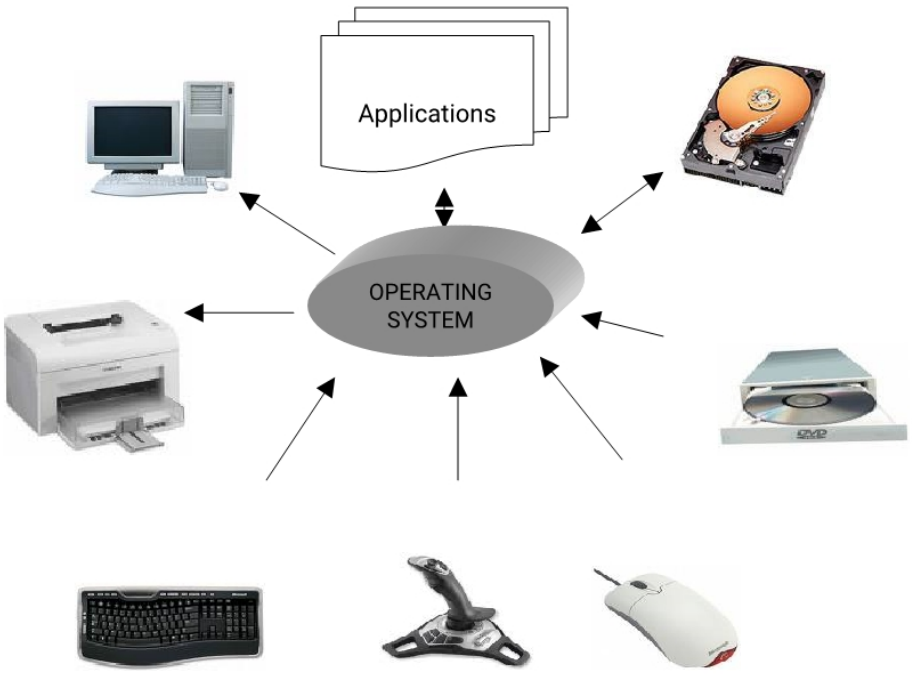


(Operating system)

Purpose of OS:

- An OS is to maximize the productivity of a computer system by operating it in most efficient manner and minimizing the amount of human intervention required.
- Many OS are designed as a collection of program modules which can be organized in combination with various capabilities around a central module or kernel.
- The purpose of an operating system is to provide an environment in which a user can execute programs in a convenient and efficient manner.

Example: [UNIX operating system- refer class diagram]

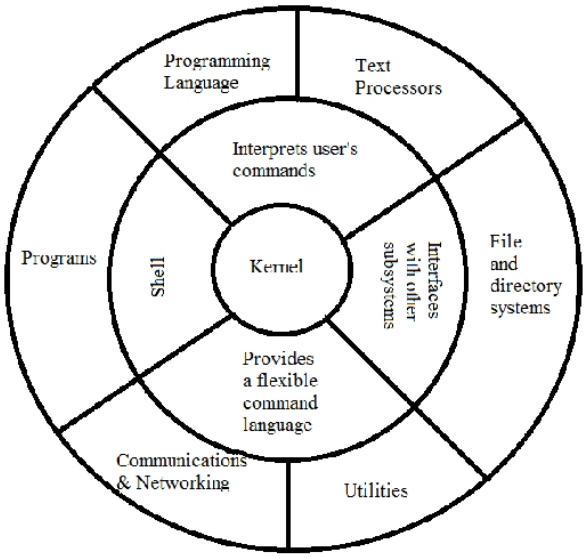


Functions of the operating System

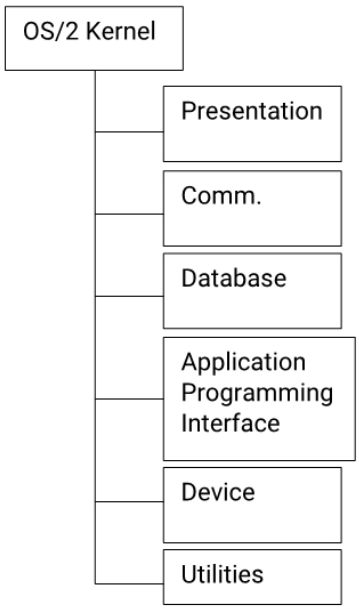
Operating systems vary in complexity from those that support single user microcomputers to those that handle multi-user mainframes. Their complexity depends

on the computer system's size and scope, together with the type of performance provided to its users. A single stand-alone microcomputer will have relatively simple operating system.

The primary purpose of an operating system is to maximize the productivity of a computer system by operating it in the most efficient manner and minimizing the amount of human intervention required. An operating system also simplifies the job of computer programmers, since it includes programs that perform common input/output and storage operations and other standard processing functions.



The UNIX Operating System



The OS/2 Operating System

Many operating systems are designed as a collection of program modules, which can be organized in combination with various capabilities around a central module, or kernel. Such operating systems can be tailored to fit the processing power and memory capability of a computer system and the type of processing jobs that need to be done one it.

Functions of an OS:

Even the simplest operating system in a minicomputer or mainframe performs a number of resource management tasks or functions. These functions include:

Job management
Batch processing
On-line processing
Data management
Virtual storage
Input-output management

1. ***Job management:***

   This software manages the jobs waiting to be processed.
   It recognizes the jobs, identifies their priorities, determines whether the appropriate main memory, secondary storage capability they require is available and schedules.
   Finally runs each job at the appropriate moment.

2. ***Batch processing:***

   System software is available to support the different methods of processing a job. It is the most basic method, in that data are accumulated and processed in groups.

   Ex: Payroll applications are often processed in this way.

3. ***Online processing:***

   Data are processed instantaneously.
   Most on-line operating systems have multi-user and multitasking capabilities.
   By this system the request for information will be instantly acknowledged.

4. ***Data management:***

   In the process of managing the resources of the computer system, operating

system software manages the storage and retrieval of data.

5. ***Virtual storage:***

Operating System manages the allocation of main memory to specific jobs. Some operating systems have a feature called **Virtual storage**.

Breaking a job into sequences of instructions called pages or segments and keeping only a few of these in main memory at a time. The reminders are kept on secondary storage devices. Relatively large jobs can be processed by a CPU that in fact contains a relatively small memory.

6. ***Input/Output management:***

It also manages the I/O operations.

This applies to the flow of data among computers, terminals and other devices such as printer.

It is also responsible for security, ensuring that unauthorized users do not access the system.

It ensures that different program and users running at the same time do not interfere at the same time.

It is also responsible for security, ensuring that unauthorized users do not access the system.

CLASSIFICATION OF OS:

- Multi-user
- Multi processing
- Multi tasking
- Multi threading
- Real-time

1. Multi-user:

It allows two or more users to run programs at the same time. It permits hundreds or even thousand of concurrent users. Another term is time sharing system.

Ex: Mainframe and minicomputer, MVS, UNIX, etc.

2. Multiprocessing:_ It refers to a computer systems ability to support more than one process at the same time. This enables several programs to run concurrently. It is more complicated than single-process systems because the OS must allocate resources to competing processes in a reasonable manner. It is also known as parallel processing.

Ex: MVS, UNIX

3. Multitasking:

This allows more than one program to run concurrently. It is the ability to execute more than one task at same time. In multitasking, only one CPU is involved, but it switches from one program to another.

Two types:

1. **Preemptive multitasking** ➔ It parcels out CPU time slices to each program.
   Ex: OS/2, Windows 95, NT, Amiga OS.
2. **Cooperative multitasking** ➔ It control the CPU for as long as it needs it.
   Ex: MS-Windows 3.x and multi-finder

4. Multithreading:

It allows different parts of a single program run concurrently. It is the ability of an operating system to execute different parts of a program called threads.

5. **Real time:**

This system that respond to input immediately. Most general purpose OS like DOS and UNIX are not real-time because they can take a few seconds, or even minutes to react.

E.g.:	Basic Real Time Monitor	BLMX	CTRON
	BSO/RTOS	C Executive	DMERT
	CCP	CTOS	CTRON

Graphical User Interfaces allows entering commands by pointing and clicking at objects that appears on the screen. A Microsoft window is an operating system, which uses a graphical user interface.

Os provides a software platform on top of application programs. The application programs must be written to run on top of a particular OS. GUIs allow to enter commands by pointing and clicking at objects that appears on the screen. MS-windows is an OS, which uses a graphical-user-interface.

PROGRAMMING LANGUAGES

Programming language is a set of rules that provides a way of instructing the computer to perform certain operations. There are more than 150 programming language exists. Mostly programming languages are said to be lower (0, 1) or higher (English).

Five levels of language:

1. *Machine language/first-generation language.*
2. *Assembly language /second-generation language.*
3. *Procedural language/ third-generation language.*
4. *Problem-oriented language/fourth-generation language.*
5. *Natural languages/ fifth-generation languages.*

Machine language:

- ♣It is the lowest level of programming language, in which information is represented as 0s and 1s.
- ♣This may be represented by on/off (or) yes/no.
- ♣The decimal range will be 0 to 9. So the value of 1 →1, 2 →10, 3 →11 etc.,
- ♣The Alphabets (A to Z) are represented as 10000001, 10000010 etc.,
- ♣This language is very tedious and time consuming, but the execution is fast and efficient.

♣The languages are machine-dependent and the programs written in machine language for one computer model, run on a different model computer.

Ex: 11001001 01011100

♣Machine code execution is very fast and efficient.

	1st generation	2nd generation	3rd generation	4th generation	5th generation
Trends: Towards conversational natural programming language					
Software Trends	User written programs	Packaged programs	Operating system	DBMS	Natural languages
	Machine Languages	Symbolic Languages	High-level languages	4th generation languages	Multi-purpose graphic-interface expert assisted packages
				Micro-computer packages	
Trend: Towards easy to use multi-purpose application packages					

Assembly language:

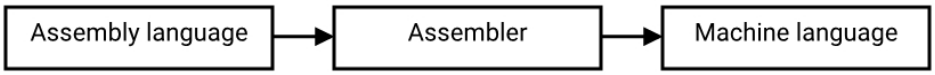
♣In 1950's to reduce the programming complexity, this language was produced.

♠It is also known as symbolic language, which uses abbreviations or mnemonic code-codes.

♠It is more easily memorized- to replace the 0's and 1's of machine language.

Machine language	Assembly language

Assembly languages do not replace machine language. Therefore, the translator converts the assembly language into machine language. This program is referred to as a source program where as the machine language is the object program.



Source program Translator Object program.

Advantages:

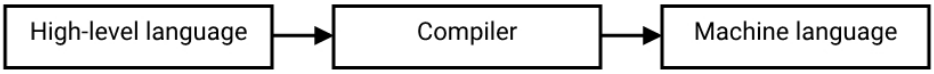
- They are more standardized and easier to use, than machine languages.
- They operate very efficiently, although not as efficient as the machine language.
- Easy to debug because it is easy to identify syntax errors.

Disadvantages:

- Programs are usually very long.
- Programs are complex.
- They are still machine dependent.

High-level languages:

High-level languages assist programmers by reducing the number of computer operation details they had to specify.



Source program Translator Object program.

Ex: **In COBOL:**

MULTIPLY A BY B GIVING C ROUNDED

Types of high-level languages:

High-level languages are sometimes used to refer all language above the assembly level. Again it is subdivided into 3 generations:

- Procedural-oriented / Third generation
- Problem-oriented / Fourth generation
- Natural /Fifth generation.

Procedural-oriented language:

General-purpose programming languages are called procedural languages. Languages such as Pascal, Basic, COBOL and FORTRAN are designed to express the logic, the procedure of a problem. It is flexible to solve a variety of problems.

Advantages:

- The program statement resembles English and hence is easier to work with them.
- Because of their English-like nature, less time is required to program a problem.
- Once coded, programs are easier to understand and to modify.
- It is still machine-independent.

Disadvantages:

- Programs execute more slowly.
- The languages use computer resources less efficiently.

Problem-oriented language:

Fourth-generation languages, also known as problem-oriented languages. They are categorized as

- ***Personal computer applications software*** ➔ word processor, spreadsheets, database managers, business graphics and integrated packages.

- ***Query language and report generators*** ➔ Selection by commands mainly for airline or railway reservations.
- ***Decision support systems and financial planning languages*** ➔ interactive software designed to make decisions employed for mathematical, statistical and forecasting procedures etc.
- ***Application generators*** ➔ it contains number of program modules, preprogrammed functions.

Differentiate 3GLS and 4GLS. (5m)

Third generation languages	**Fourth generation languages**
Use by professional programmers	Used by both professional and non professional Programmers
How to perform tasks?	What task is to be performed?
All alternatives must be specified	No need to specify the alternatives.
Require large number of procedural instructions	Require fewer instructions
Code may be difficult to read, understand and maintain	Code is easy to understand and maintain.
Language developed for batch operation	Language developed primarily for on-line use
Difficult to learn	Easy to learn
Difficult to debug	Easy to debug
Typically file-oriented	Database oriented

Write a note on Natural Language.

They are still in developmental stages. It has two characteristics:

- They are designed to make the connections that humans have with computers more natural – more humanlike.
- They are designed to allow the computer to become "smarter"- to actually simulate the learning process by remembering and improving upon earlier information.

Eg: LISP and PROLOG

Compilers and Interpreters:

These are the two kinds of translators. High-level languages are called either compiled languages or interpreted language.

Compiler:

- In a compiled language, a translation program is run to convert the programmer's entire high-level program, which is called the source code, into a machine language code. This translation process is called **compilation.**
- Machine language codes are called as object code.

Ex: COBOL, C, C++, FORTRAN

Interpreter:

- In an interpreted language, a translation program converts each program statement into machine code just before the program statement is to be executed. Translation and execution occur immediately one after another, one statement at a time.

Ex: BASIC

Compilation process:

Objective of the compiler is to transform a program written in a high-level programming language from source code into object code.

The process of converting each program statement into machine code is called as interpreter. Object code is not stored so there is no compilation. When a statement is executed several times, that statement is converted to machine language, each time it is executed. e.g.: BASIC

Advantages:

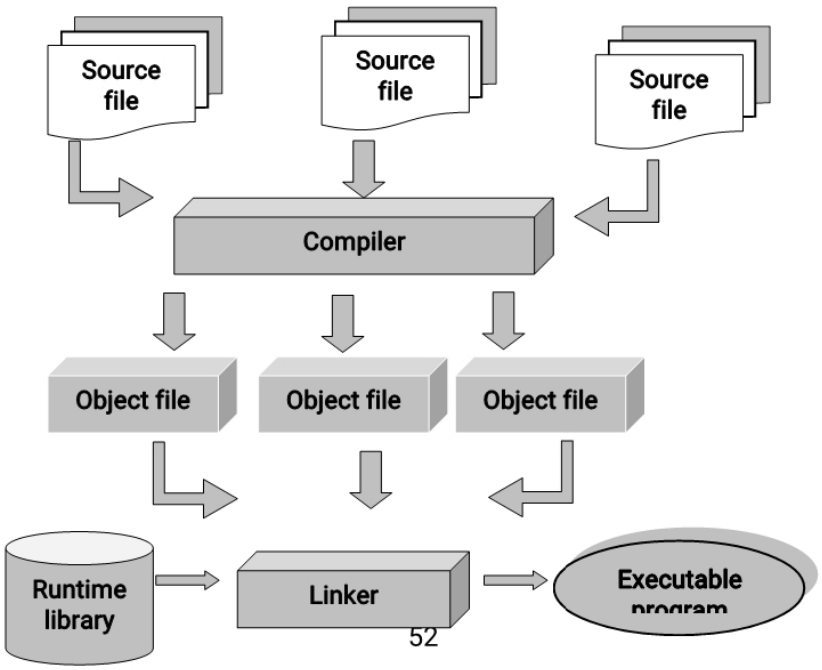
They need not create object code and easier to develop.

Programmers write program in form called source code, goes through several steps, before it becomes an executable program.

E.g.: They convert data from digital to analog and back, code and decode data

Compilation process

The objective of the compiler is to transform a program written in a high-level programming language from source code into object code.



UNIT –III

DATA PROCESSING

Data processing also known as information processing is defined as the processing of data to make it more usable and meaningful, thus transforming it into information.

Data versus Information:

Data is the plural of datum. Data is commonly used to represent both singular and plural forms. Data is commonly defined as raw measurements of the attributes of entities.

Data commonly takes a variety of forms including numeric data, text, voice and images. Information can be defined as data that has been transformed into a meaningful and useful context for specific end users.

Data is usually not useful until subjected to a value added process where:

- Its form is aggregated, manipulated and organized.
- Its content is analyzed and evaluated.
- It is placed in a proper context for a human user.

File processing:

Computer data is processed in two fundamental ways:

- ***File processing*** → Data is stored and processed in separate files. These files may be sequential and direct access file
- ***Database processing*** → Collection of integrated records.

Sequential file processing:

Sequential file processing stores and accesses records in sequence. Such processing can be accomplished either by using tape storage or disk storage.

To perform the processing, records are sorted before they are processed. Sequential file processing is used in situation where data can be processed in batches.

Direct-access files processing:

There are many ways of organizing a file for direct-access.

- First, he file must be stored on a direct-access device like a disk, so that the records need not be processed in sequence.
- Second, some means must be developed for determining the location of a particular record.

Problems with file processing:

File processing is the backbone of the computer industry for many years. The drawbacks of file processing are as follows:

Data duplication waste files space. When the same data is stored in two or more places. The possibility exists that the values will come to disagree with one another. This will create integrity problem.

It is very difficult to relate records from one file to another.

Database processing:

- A database is a self-describing collection of integrated records. It contains a directory, or dictionary of its contents.
- In database processing, the database management system acts as an intermediary between the user, or application program, and the database.

- The DBMS stores and processes the data so that records can be accessed via their relationship to other records. The maintenance of the relationships, data integrity and other related tasks are taken care by DBMS.

Database Management Systems

- A database management system (DBMS) is system software for creating and managing databases. The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage data.
- Database Management System: The software which is used to manage database is called Database Management System (DBMS). For Example, MySQL ..

Components of a DBMS

- Hardware. ...
- Data. ...
- Procedures. ...
- Database Access Language. ...
- Query Processor. ...
- Run Time Database Manager. ...
- Data Manager.

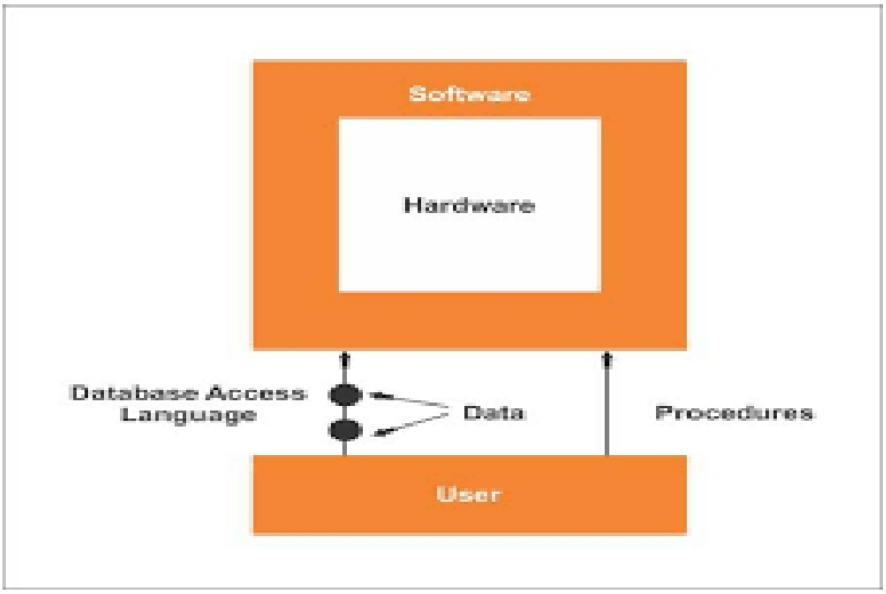


Fig: components of DBMS

Functions of DBMS

Functions in the DBMS are: data dictionary management,

- Data storage management,
- Data transformation and presentation,
- Security management,
- Multiuser access control
- Backup and recovery management,
- Data integrity management,
- Database access languages and application programming interfaces,
- Database communication

Functions of a DBMS

A DBMS makes it possible for users to create, edit and update data in database files. Once created, the DBMS makes it possible to store and retrieve data from those database files.

More specifically, a DBMS provides the following functions:

Concurrency: concurrent access (meaning 'at the same time') to the same database by multiple users

Security: security rules to determine access rights of users

Backup and **recovery**: processes to back-up the data regularly and recover data if a problem occurs

Integrity: database structure and rules improve the integrity of the data

Data descriptions: a data dictionary provides a description of the data

COMPUTER NETWORKS

Network

A Network is a group of two or more computer systems linked together.

Define telecommunication.

Telecommunication is the sending of information in any form from one place to another using electronic or light emitting media.

Data communication describes the transmitting and receiving of data over communication links between one or more computer system and a variety of input, output terminals.

Define communication network.

A communication network is any arrangement where a sender transmits a message to a receiver over a

Components of the Network

- Terminals

- Telecommunication processes
- Telecommunication channels and media
- Telecommunication software
- Computer

Terminals:

It includes video display terminals and other end user work stations. Any input output device that uses a network to transmit or receive data is a terminal. This includes microcomputer, telephones, fax machine etc.

Telecommunication processors:

These are devices, which support data transmission and reception between terminals and computers. These devices such as modem, multiplexers and front-end processors perform a variety of control and support function in a network.

Telecommunication channels and media:

The media over which data's are transmitted and received are called telecommunication channel. Telecommunication channel use combinations of media, such as copper wires, coaxial cables, fiber optic cables, microwave system. Communication satellite systems are used to interconnect the components of a network.

Computer:

Mainframe computer may serve as a host computer for a large organizations network assisted by minicomputers acting as network servers for similar networks of end user microcomputer workstations.

Telecommunication software:

Telecommunication software consist of programs that reside in host computer systems, communication controls computer and end user computer.

Communication processors:

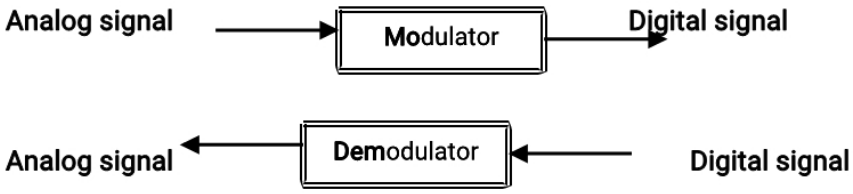
Communication processors resemble computer CPU's in similar circuitry, memories and in programming, but their purpose is limited.

This includes the following:

- Modems
- Message switchers
- Multiplexers
- Concentrators
- Controllers and front-end processors.

Modem:

It converts the digital signals from a computer or transmission terminal at one end of a communication link into analog signals which can be transmitted over ordinary telephone lines. At the other end converts the transmitted data back into the digital form at receiving terminal. This process is known as ***modulation and demodulation.***

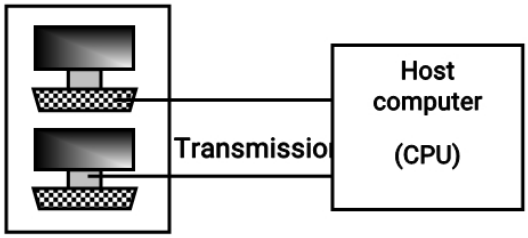


Message switches:

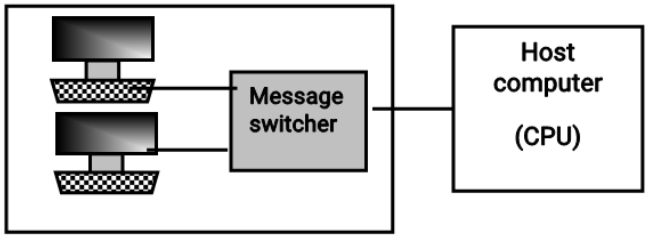
It is a processor that receives data messages from terminals, determines their destination and routes them one at a time to the CPU. It distributes the messages coming from the CPU to the appropriate terminal.

Advantages:

- It reduces long distance transmission costs, since only single line is needed.



(fig: Communication without message switchers)



(fig: Communication with

message switchers)

Multiplexers, concentrators & controllers:

Multiplexers allow several terminals to use one line to communicate with a CPU. In other words, collects message from various senders and put them in order and transmits them along a broadband channel to the receiver.

A Concentrator is also a multiplexer- it can be programmed, has more processing capability and is more flexible than a multiplexer.

Controllers or cluster controller link groups of terminals or other devices to a communication channel.

Front-end processors:

It is located at the site of the CPU or the host computer and its purpose is to relieve the central computer of the communication tasks.

It has some identical circuitry and performs many of the operations.

Communication media:

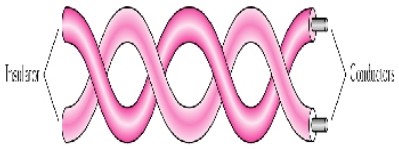
Channels also called communication lines or links. It means by which data is transmitted between the sending and receiving devices in a network.

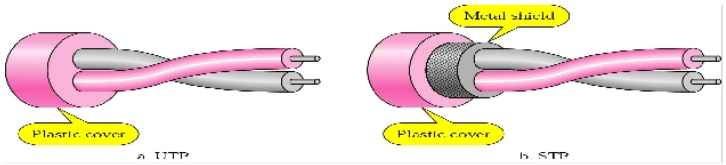
These include twisted-pair wire, coaxial cables and fiber optic cables all of which physically link the devices in a network.

It also includes microwave systems, communication satellite systems and cellular radio wave, all of which are microwave and other radio waves to transmit and receive data.

- **Twisted pair wire:**

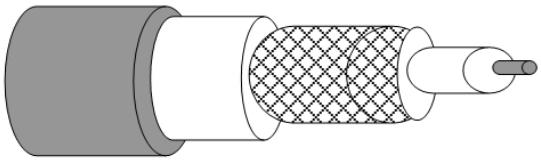
It consists of copper wires twisted into pairs. These lines are used in establishing communication networks throughout the world for both voice and data transmission.





(Twisted pair) **(Unshielded Twisted pair)**

- **Co-axial cable:**
  - It consists of sturdy copper or aluminum wire wrapped with spacers to insulate and protect it. The insulation minimizes the interference and distortion of the signals the cable carries.
  - Cables can be bundled together in a big cable for ease if installation, with high quality. It is used to be laid on the floors of lakes and oceans.



(Coaxial cable)

- **Fiber optic cables:**
  - It use cables consisting of one or more hair thin filaments of glass fiber wrapped in a protective jacket.
  - They can conduct light pulses generated by lasers at transmission rates as high as 2 billion bits per second.
  - It provides substantial size and weight reduction. A half-inch diameter fiber optic cable can carry up to 50,000 channels. They are not affected by and

do not generate electromagnetic radiation. It has much lower data error rate than other media.

- **Microwave system:**
    - This transmits high speed radio signals in a line-of-sight path between relay stations spaced approximately 25 to 35 mile apart.
    - The waves cannot bend with the curvature of the earth; they are relayed through antennas usually placed on top of buildings, towers, hills and mountain peaks.
    - Microwave consists of high frequency radio waves that travel in straight lines through the air rather than through wires.
- **Communication satellites:**

Communication satellites in space orbiting 22,000 miles above the earth are also used as microwave relay stations because they rotate at the precise point.

Satellite launched by INTELSAL accounts for most long-distance international communications.

What is telecommunication software?

Software is a virtual component of all telecommunication networks. Communication control software includes programs stored in the host computer as well as programs in the front-end computers and other communication processor.

Telecommunication software package for large computer networks are frequently called telecommunication monitors or teleprocessing monitors. Many communication software packages are also available for micro computers.

Functions of telecommunication software:

- **Access control:**

It establishes the connections between terminals and computer in a network. This function may also involve automatic telephone dialing and redialing, logging on and off with appropriate account numbers and security code and automatic answering of telephone calls from another computer.

- **Transmission control:**

This function allows computers and terminals to send and receive commands, messages, data and programs that are being transmitted in the form of files. So this activity is frequently called file transfer.

- **Network control**:

It manages communication in a network. Software determines transmission priorities, routes messages, polls terminals in network and forms waiting lines of transmission requests.

- **Error control:**

It involves detection and correction of transmission errors. Errors are usually caused by distortions in communication channels. Such as line noise and power surges. By adding control codes to the message error can be checked. Most error correction methods involve retransmission.

- **Security control**

It protects communication network from unauthorized access. Data transmission can also be protected by coding techniques called encryption.

COMPUTER NETWORKS

Types of networks:

1. LAN: (Local Area Network) - The computers are geographically close together.

2. WAN (Wide Area Network) - Computers are farther apart and are connected by telephone lines or radio waves.

Characteristics used to categorize different types of networks.

- ***Topology*** → The geometric arrangement of a computer system. Common topologies include a bus, star and ring.
- ***Protocol*** → It defines a common set of rules and signals that helps computer to communicate.
- ***Architecture*** → Network can be classified as either peer-to-peer or client/server architecture.

Computers on a network are sometimes called nodes. Computers that allocate resources for a network are called servers.

- **Local Area Network (LAN):**
  - It is usually privately owned and links the devices in a single office, building or campus LAN size is limited to few kilometers.
  - LANs are designed to allow resources to be shared between personal computers or workstations. The resources to be shared can include hardware, software or data.
  - LANs are distinguished from other types of networks by their transmission media and topology. LAN will use only one type of transmission medium. Common topologies used are bus, ring and star.
  - Data rates – 4 to 16mbps range. It can share expensive devices, such as laser printers, as well as data.

  Types of LANs:

  Token-Ring network

  Ethernets

  ARCNets

  LANs are capable of transmitting data at very fast rates, but the distance is limited.

- **Wide Area Network (WAN)**
  - A WAN is a computer network that spans a relatively large geographical area. WAN consists of two or more LANs.
  - Computers connected to a public network are often connected through public networks, such as telephone system.
  - It provides long-distance transmission of data, voice, image and video information over large geographical areas that may comprise a country, a continent, or even the whole world.
  - A WAN is wholly owned and used by a single company is often referred to as an enterprise network.

Network **Topology.**

Topology is the geometric arrangement of the computers in network. It is a way in which the nodes of a network are linked together. It determines the data paths, which may be used between any pair of nodes in the network.

Some factors for installing a network are:

- The desired performance of the system.
- The desired reliability of the entire system.
- Size of the system.
- Expandability of the system.
- Cost of the components and services required to implement the network.
- Availability of communication lines.
- Delays involved in routing information from one node to another.

Common topologies include star, ring and bus.

Star Network:

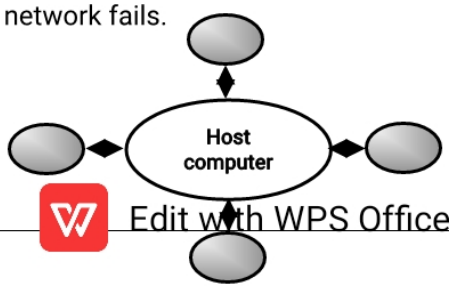
- Used to connect one or more small computers or peripherals devices to a large host computer or CPU. Star network is frequently used in a LAN to connect several microcomputers to a central unit that works as a communications controller.

Advantages:

- It has minimal line cost because only n-1 lines are required for connecting n nodes.
- Transmission delays between two nodes do not increase by adding new nodes.
- If any local computer fails, the remaining portion of the network is unaffected.

Disadvantage:

- The system depends on the central node. If the host computer fails the entire network fails.



Ring Network:

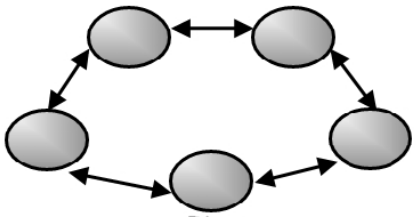
- It is a local area network whose topology is a ring- can be as simple as a circle or point to point connection of computers at dispersed locations. (With no central host.)
- Access and control of ring networks are typically maintained by a "token passing" system. A token-ring network resembles a merry go-round.
- They can span larger distances than other types of networks, because each node regenerates messages as they pass through it.

Advantage:

- It works well where there is no central site computer system.
- It is more reliable than a star because communication is not dependent on a single host computer.
- Alternate routing is possible.(when link between two computers fails)

Disadvantages:

- Communication delay is directly proportional to the number of nodes in the network.
- It requires more complicated control software than star network.

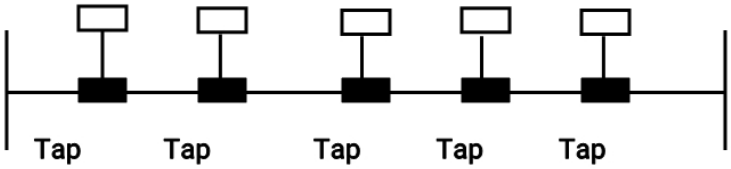


Ring

Bus Network:

- It is similar to ring networks except that the ends are not connected. All communications are carried on a common cable or bus and are available to each device on the network.

- Access and control are maintained by a method called contention.
- It two or more terminals initiate messages simultaneously they must stop and transmit data at different intervals.



Advantages:

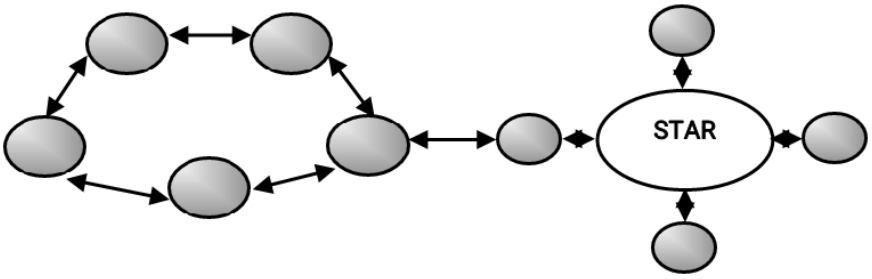
- It helps in reducing the number of physical lines.
- The failure of a computer does not affect the communication among other computers in the network.
- Addition of new computers to the network is easy.

Disadvantages:

- All computers in the network must have good communication and decision-making capability.
- If the communication line fails, the entire system breaks down.

Hybrid network:

It is a combination of two or more different network topologies. The exact configuration of the network depends on the needs and the overall organizational structure of the company involved.



Ring

Define Protocol.

A protocol is an agreed-upon format for transmitting data between two devices. It is a set of formal operating rules, procedures or conventions that govern a given process.

Define Communication or network protocol.

It describes the rules that govern the transmission of data over communication networks. These rules provide a method to exchange data between the sender and receiver and for the proper interpretation of controls and data, which are transmitted as raw bits and bytes.

Protocols determine the following:

- The type of error checking to be used.
- Data compression method.
- How the sending device will indicate that it has finished sending a message.
- How the receiving device will indicate that it has received a message.

Roles of a communication protocol

- Data sequencing
- Data routing
- Data formatting
- Flow control
- Error control
- Precedence and order of transmission
- Connection establishment and termination
- Data security
- Log information

Some popular protocols are:

- TCP/IP- Transmission Control Protocol/ Internet Protocol
- HTTP – HyperText Transfer Protocol
- FTP – File Transfer Protocol

- SMTP – Simple Mail Transfer Protocol
- POP – Post Office Protocol
- ETHERNET
- TOKEN RING
- XModem
- Kermit
- MNP

Explain network architecture in brief.

- The term architecture refers to either hardware or software or a combination of both.
- It always defines its broad outlines and may define precise mechanisms as well.
- An Open architecture allows the system to be connected easily to devices and programs made by other manufacturers.
- A system with a closed architecture is one whose design is proprietary, making it difficult to connect the system to other systems.

Classification of network architecture:

1. Peer to Peer Architecture:

Here each workstation has equivalent capabilities and responsibility. It is simpler and less expensive, but usually do not offer the same performance under heavy loads.

2. Client / Server Architecture:

Here each computer or process on the network is either a client or server. Servers are powerful computers or processor dedicated to managing disk drives, printers or network traffic. Clients are less powerful PCs or workstations on which users run applications clients rely on servers for resource, such as files, devices and even processing power.

UNIT –III COMPLETED

UNIT-3

2marks:

1. What do you mean by compiler?
2. Define network protocol.
3. Define Protocol.
4. What is a word processor?
5. What is meant by presentation graphics?
6. Define DBMS.
7. What is Operating System?
8. What is the purpose of OS?
9. Write the functions of an OS.
10. Explain about virtual storage
11. Explain multi-user OS.
12. Define multithreading.
13. Define programming language.
14. State the five levels of languages.
15. What is the other name for assembly language?
16. Explain multiprocessing. (Or) What is meant by parallel processing?
17. List the types of high-level languages.
18. Write a note on Natural Language.
19. Define Interpreter.
20. What is a word processor?
21. What is meant by presentation graphics?

22. Define DBMS.
23. What is Operating System?
24. What is the purpose of OS?
25. Write the functions of an OS.
26. Explain about virtual storage.
27. Explain multi-user OS.

5marks:

1. Write a note on Network Architecture.
2. Write a note on Network Protocols.
3. Write a note on BUS network.
4. What are the different types of operating systems?
5. How will you classify OS?
6. Explain different generations of programming languages.
7. Write short notes on machine language.
8. Write short notes on assembly language.
9. Write short notes on HLL.
10. Write short notes on problem-oriented language.
11. What are the different types of operating systems?
12. How will you classify OS?
13. Explain different generations of programming languages.
14. Write short notes on machine language.
15. Write short notes on assembly language.
16. Write short notes on HLL.
17. Write short notes on problem-oriented language.

10marks:

1. Write a brief note on high-level language.
2. Explain the functions and classification of Operating Systems?
3. Write a brief note on high-level language.
4. Explain the functions and classification of Operating Systems?

UNIT-IV

Internet Access

Internet **access** is the ability of individuals and organizations to connect to the **Internet** using computer terminals, computers, and other devices; and to **access** services such as email and the World Wide Web.

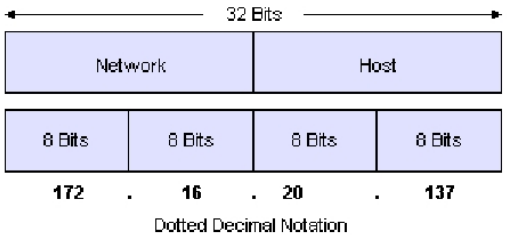
- ACCESS PROVIDERS
- They provide access to internet through telephone lines, cable wi-fi or fiber optics.
- **MAILBOX PROVIDER**
- Such providers offer mailbox hosting services.
- **HOSTING ISPS**
- Hosting ISPs offers e-mail, and other web hosting services such as virtual machines, clouds etc.
- **VIRTUAL ISPS**
- Such ISPs offer internet access via other ISP services.
- **FREE ISPS**

  Free ISPs do not charge for internet services.

Internet Addressing

- An Internet Protocol address (IP address) is a numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication.

- An IP address serves two principal functions: host or network interface identification and location addressing



INTERNET ADDRESSING

Internet protocols

The most commonly used protocols are

- Transmission Control Protocol/Internet Protocol (TCP/IP)
- File Transfer Protocol (FTP)
- Hyper Text Transfer Protocol (HTTP)
- Telnet
- Gopher
- Wide Area Information Service (WAIS)

Transmission control protocol/Internet Protocol (TCP/IP)

IP The IP component does the following;

- Envelopes and addresses the data
- Enables the network to read the envelope and forward the data to its destination
- Defines how much data can fit in a single “envelop” (a packet).

TCP The TCP component does the following

- Breaks data up into packets that the network can handle efficiently

- Verifies whether all the packets have arrived at their destination
- "Reassembles" the data.

TCP/IP can be compared to moving across country.

File Transfer Protocol (FTP)

FTP stands for File Transfer Protocol, and is part of the TCP/IP protocol suite. It is the protocol, or set of rules, which enables files to be transferred between computers. FTP is a powerful tool which allows files to be transferred from "computer A" to "computer B" or vice versa.

FTP works on the client/server principle. A client program enables the user to interact with a server in order to access information and services on the server computer. Files that can be transferred are stored on computers called FTP servers. To access these files, and FTP client program is used. This is an interface that allows the user to locate the file(s) to be transferred and initiate the transfer process.

The basic steps to use FTP are:

1. Connect to the FTP server
2. Navigate the file structure to find the file you want
3. Transfer the file.

There are a wide variety of files that are publicly available through anonymous FTP :

- Shareware – software that you can use free for a trial period but then pay a fee for.
- Freeware – completely free software, for example fonts, clipart and games.
- Upgrades & Patches – upgrades to current software and "fixes" for software problems.
- Documents – example include research papers, articles and Internet documentation.

Files on FTP servers are often compressed. Compression decreases file size. This enables more files to be stored on the server and makes file transfer times shorter. In order to use a compressed file it needs to be decompressed using appropriate

software. It is a good idea to have current virus checking software on the computer before files are transferred to it.

Hypertext Transfer Protocol (HTTP)

HTTP is short for Hypertext Transfer Protocol. It is the set of rules, or protocol, that governs the transfer of hypertext between two or more computers. The World Wide Web encompasses the universe of information that is available via HTTP.

Hypertext is text that is specially coded using a standard system called Hypertext Markup Language(HTML). The HTML codes are used to create links. These links can be textual or graphic, and when clicked on, can “link” the user to another resource such as other HTML documents, text files, graphics, animation and sound.

HTTP is based on the client/server principle. HTTP allows “computer A” (the client) to establish a connection with “computer B” (the server) and make a request. The server accepts the connection initiated by the client and sends back a response. An HTTP request identifies the resource that the client is interested in and tells the server what “action” to take on the resource.

When a user selects a hypertext link, the client program on their computer uses HTTP to contact the server, identify a resource, and ask the server to respond with an action. The server accepts the request, and then uses HTTP to respond to or perform the action.

Usually hypertext links will be blue in colour and will be underlined (this is the normal convention, which is not always followed). When you move the mouse pointer over a hypertext link the pointer changes its shape to that of a hand. In the case of text based browsers, the hypertext links will be highlighted and you can navigate between the using the keyboard.

HTTP also provides access to other Internet protocols like File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), Network News Transfer Protocol (NNTP), WAIS, Gopher, Telnet, etc.

Telnet

Telnet is a protocol, or set of rules, that enables one computer to connect to another computer. This process is referred to as remote login.

Once connected, the user's computer emulates the remote computer. When the user types in commands, they are executed on the remote computer. The user's monitor displays what is taking place on the remote computer during the telnet session.

The procedure for connecting to a remote computer will depend on how your Internet access is set-up. Once a connection to a remote computer is made, instructions or menus may appear. Some remote machines may require a user to have an account on the machine, and may prompt users fro a username and password. Many resources, such as library catalogs, are available via telnet without an account and password.

Telnet also operates on the client/server principle. The local computer uses a telnet client program to establish the connection and display data on the local computer's monitor. The remote, or host, computer uses a telnet server program to accept the connection and send responses to requests for information back to the local computer.

Telnet allows the user to access Internet resource on other computers around the world. A variety of resources are available through telnet. For example: Library catalogs, Database, other Internet tools such as FTP, Gopher, and the World Wide Web, etc.

INTERNET WORLD WIDE WEB

The World Wide Web (abbreviated as WWW or W3, commonly known as the web), is a system of interlinked hypertext documents accessed via the Internet. With a web browser, one can view web pages that may contain text, images, videos, and other multimedia, and navigate between them via hyperlinks.

- The **Internet** is a global system of interconnected computer networks.
- In contrast, the **web** is one of the services that run on the Internet. It is a collection of text documents and other resources, linked by hyperlinks and URLs, usually accessed by web browsers from web servers. In short, the web can be thought of as an application "running" on the Internet.

  Viewing a web page on the World Wide Web normally begins either by typing the

URL of the page into a web browser or by following a hyperlink to that page or resource. The web browser then initiates a series of communication messages, behind the scenes, in order to fetch and display it. In the 1990s, using a browser to view web pages and to move from one web page to another through hyperlinks came to be known as 'browsing,' 'web surfing,' or 'navigating the web'.

INTRODUCTION

Internet is the world's largest computer network, the network of networks, scattered all over the world. It was created nearly 25 years ago as a project for the U.S. Department of Defense.

From a handful of computer and users in the 1960s today the Internet has grown to thousands of regional networks that can connect millions of users. Any single individual, company or country does not own this global network.

A network of networks, or "Internet," is a group of two or more networks that are:

- Interconnected physically
- Capable of communicating and sharing data with each other
- Able to act together as a single network.

Machines on one network can communicate with machines on other networks, and send data, files and other information back and forth.

To be used by different types of machines and yet be understood by all of them, the software must follow a set of rules, or protocol. The internet, with a capital "I," is the network of networks, which either uses the TCP/IP protocol or interacts with TCP/IP networks via gateways (the interpreters). The internet presents these networks as one, seamless network for its users.

The internet covers the globe and include large, international networks as well as many smaller, local-area networks(LANs).

The internet offers access to data, graphics, sounds software, text, and people through a variety of services and tools for communication and data exchange:

- Remote login (telnet)
- File transfer (ftp)

- Electronic mail (e-mail)
- News (USENET or network news)
- Hypertext(WWW)

SPECIAL ABOUT INTERNET

There are three obvious reasons. Internet is the cheapest and fastest means to

- Get information
- Provide information
- Compile information

Getting information on the internet

The most recent and very successful attempt at presenting information over the Internet is the World Wide Web (WWW). You could get information about people, products, organizations, research data, electronic versions of the printed media, etc. from the Internet.

Providing information on the internet

For an organization or institution, setting up a home page is a good way to let the world know what its products and services are. In addition to advertising, the other critical functions that relate to provision of information are

- Publishing, including full text articles, reports, illustrated articles, abstracts, computer programs, and demonstrations.
- Extension, in which some of the delays associated with the printed media, may be reduced.
- Teaching, the possibilities here include both distance learning and assistance for students.

Compiling information from the Internet

This is obviously a special case of “getting “information. The distinction is that it is possible to get specialized information from the web. For instance, if you wanted to poll the readership for a magazine or conduct a survey to detect the pulse of a selected community, the web provides you with the ideal platform and opportunity. Using forms, e-

mail, etc.

Internet access

Connect the internet in one of two basic ways, dialing into an Internet Service Provider's (ISP) computer, or with a direct connection to an Internet Service Provider. The difference is mainly in the speed and cost. Connect to your ISP using a telephone line and modem. This type of connection is called the Dial-up connection. Some times you go in for a direct connection. These two types of connections in a little detail.

Dial-up connection

With a dial-up account, you use your modem to convert computer bits and bytes into modulated (tonal) signals that the phone lines can transmit. These signals are received by a modem at your ISP and demodulated into bits and bytes for their computer. Dial-up access is either by way of SLIP (Serial Line Internet Protocol) or PPP (Point to Point Protocol).

To establish a conventional dial-up connection to the Internet, you will need the following:

1. an account with an Internet Access Provider (In India, VSNL, Satyam Online, etc are some of the Internet Access Providers). The account can be either TCP/IP or Shell.
2. a telephone connection.
3. a computer with serial port (for External modems) or an expansion slot (for Internal modems).
4. a modem (external/Internal).
5. a communication (or terminal emulation) software. SLIP/PPP(TCP/IP) account holders will require a browser software (Internet Explorer, Netscape Navigator, etc.) and an e-mail software (Microsoft Internet Mail, Netscape Messenger, Eudora, etc). For shell account holders the browser software(Lynx) and the E-mail software (Pine) are usually available with the Internet Access.

Direct connection

Get a direct connection to your ISP, where you have a fixed cable or a dedicated phone line to the ISP. Often the dedicated line is an ISDN (Integrated Services

Digital Network) line which is a higher-speed version of the standard phone line, but actually requires two phone lines. ISDN can handle more than 56,000 bps.

A dedicated line called a T-1 or T-3. A T-1 (Tee-one)line can handle 1,280 kilobytes per second. A T-3 line can handle ten times that speed. A network in the office and several people need to access the Internet simultaneously, consider ISDN or T-1 connection.

Internet Basics

Faced with the wide range of features and options and the scope, magnitude and amount of information and other resources, *newbies* spend a lot of time simply finding their bearings.

Once you know the information that you want to find, how to find it, where to find it and how to access it, the internet becomes and extremely powerful resource irrespective of whether you are using it for work, education, entertainment or just for the fun of exploring. Once you know how to send and receive electronic mail, subscribe to mailing lists, join and participate in discussion groups and internet chats, your power to communicate with people anywhere in the world increases dramatically. The beauty of internet is that all these power and resources are available at a very minimal cost.

What should I do

For beginners, the best way to get inducted into the cyber world is to start browsing the Internet using one of the powerful web browsers like Internet Explorer (Microsoft Corporation) or Netscape Navigator (Netscape Communications).

Web browsers are mainly used to access pages of the World Wide Web. By clicking on the hypertext links on a page it is possible to jump from one Internet site to another, regardless of its location. Hypertext links are usually highlighted or different colored text, images or icons. You can check for hypertext links by moving the mouse over the area;

Given below is a list of activities that you could do with a web browser:

- visit web sites
- send and receive electronic mail

- read and post articles in newsgroups
- download files to your PC.
- Chat with other users on-line.
- Play games with other on-line.
- Access on-line multimedia including radio and video broadcasts
- Search the Internet for information
- Subscribe to electronic newsletters, e-zines, etc.
- Join contests
- Contribute articles, and other materials
- Do on-line shipping
- Post your resumes on the Internet
- Create your own websites
- Create an e-mail ID and account for you
- Use the e-mail remainder service
- Find a person's details
- Send flowers or gifts to others

Internet Relay Chat (IRC)

- Internet Relay Chat, (or IRC for short) is a real-time communication mechanism used on the internet. On IRC, users have the opportunity to communicate with each other either publicly or privately. Most IRC clients also provide the ability to share files. Users wishing to participate in one or more IRC conversations use an IRC client to connect to an IRC network.
- Users are identified by a unique sequence of characters chosen at the time of connection, known as a nickname.
- If the desired nickname is already taken by another user, then another nickname must be chosen. Any specific nickname may or may not be available when a user attempts to connect to the IRC network. It is also possible to change nicknames while

connected to IRC.

- Once connected, a user is free to communicate with a single individual in private messages, or with groups of individuals by joining channels. Private messaging takes place between exactly two users on an IRC network.
- A user engages in private messaging by sending a message to another user. Users choosing to engage in private messaging are not required to join any channel. However, any user may be on any number of channels, and may send private messages to other users while connected to an IRC network.
- A channel provides a method for many users to communicate simultaneously on a given subject of interest to the group.
- Any text submitted by a user into a channel is transmitted to each user in that channel. An IRC network may have many thousands of channels to choose from, covering a wide range of topics. An IRC network is a group of one or more IRC servers connected to each other.
- Most servers on an IRC network accept incoming client connections. However, some servers exist solely as network hubs, keeping the network traffic routed efficiently.

E-MAIL

Email, sometimes written as e-mail, is simply the shortened form of "electronic mail," a system for receiving, sending, and storing electronic messages. It has gained nearly universal popularity around the world with the spread of the Internet. In many cases, email has become the preferred method for both personal and business communication.

How e-mail Is Used?

Working of mail is quite simple. First type the message. Type recipient's e-mail address and press send button. The e-mail message arrives at service provider's server. If it recognizes the e-mail address as valid, the mail will be sent.

The e-mail sent via the internet. It will be received by the recipient's provider. It is sent to the provider's mail server where it will be delivered to the recipient's mail box. Finally it will remain there until the recipient next connect to the internet.

e-mail-names & addresses

e-mail allows information to be sent between computers and people on the internet.an e-mail message can be sent to one or more e-mail addresses.an e-mail address identifies a person and computer for purposes of exchanging e-mail messages.the structure of e-mail address is:

username@host.subdomain.second-level-domain.first-level-domain

for examples:alexis_leon@poboxes.com

- "Alexis" is the name of the person sending or receiving the message, this referred to as the username.
- "poboxes" is part of the domain name of the organization
- "com" is also part of the domain name and indicate that "poboxes" is a commercial organization.

MAILING BASICS:

To compose an e-mail message,click on the 'compose new message' button on the toolbar.it will show:

- **To**-enter the e-mail address of the person to whom the message is sent.
- **Cc**-enter the e-mail address of the person to whom the copy of the message is sent.
- **Subject –**enter a brief description as to what the message is about.
- **Body-**enter the actual message here.

Address book:

An address book is a place to store information about the people with whom you correspond. In address book to select the person's name ,and the e-mail ID will automatically get inserted.

In this we used to create new addresses to it,create group to sent mail to all members,modify the details, delete person's name.

Signature:

This is used to typing your name and address at the end of each message.if we don't want signature at the end,to uncheck the option.

File attachments:

One major drawbacks of e-mail is that we cannot send formatted text.if we send a word document ,which contains pictures,bulleted lists,etc.,it will be lost.

The solution is to compress the file and attach to the mail,which will reduce the file size and save time and money during transmission.

Setting priority:

For setting priority to mail message the usual values are 'low','normal','high'.set the priority of a mail as high,we indicate that it needs immediate attention.

Replying and forwarding E-mail messages:

Reply to the author by pressing a button.there are two options for replying to a mail:

'reply to author' and *'reply to all'* .in the first case, reply mail will be sent only to the person who had sent the mail to you.in the second case,reply will be sent to all the persons.

The message that is being forwarded will be intented with '>'symbol as in case of replying.to enter the e-mail ID of the person to whom the message is being forwarded.

The difference between replying and forwarding is that reply the person who had sent the mail,but forward a message to anybody you like.

E-MAIL ETHICS:

- Let your message have a personal touch
- Be friendly
- Be succinct and considerate of recipient's time
- Know your recipient
- Avoid sarcasm,think very carefully before using e-mail to express anger.
- Be careful about use of irony
- Be brief
- Make the subject line precise
- Don't copy the full text of a long message into your response

- Don’t assume that everybody like emoticons
- Look sharp
- Use your technology
- Compose your messages off-line
- Read the message before sending it
- Most e-mail programs these days let you insert what’s called a signature at the bottom of the message.
- Configure your e-mail client to check all your accounts in one shot.
- If security is not a concern,configure your e-mail client to remember passwords.
- Get a free-mail account for personal e-mail
- If sending large files of attatchments,compress before sending them
- Avoid “urgent” or “priority” unless it really is.

E-MAIL ADVANTAGES:

- Access 24 hours a day from anywhere in the world to endless amounts of data and information.
- Global communication is easier
- The technology also has opened the door for more types of professionals to work at home
- Work can now be done anywhere a computer can be plugged in

E-MAIL DISADVANTAGES:

- Created an information overload. People are swamped by junk mail
- The very existence of electronic communication has perpetuated the myth that it will lead to better communication.
- Distraction and can prevent people from doing any productive work

MULTIMEDIA:

Introduction:

- Multimedia is one of the fastest growing and most exciting areas in the information technology field.
- Multimedia is widely used in the entertainment and education field.
- Multimedia presentations are more effective than an ordinary presentation using charts and white board.
- Today multimedia is used every where form business presentation to movies.
- It is used for training, employee orientation and marketing.
- Multimedia in entertainment
- Multimedia in software training
- Multimedia in education and training
- Multimedia on the web
- Multimedia in office work
- Multimedia servers and databases

Multimedia in entertainment:

- One of the earliest applications of multimedia was for computer games.
- Multimedia is being used in movie-marketing very extensively.
- With the help of multimedia, the movie makers mow have the capability of creating what they want in the imagination is the only limitation.
- Multimedia in software training;
- As computer applications and programs become more complex, software developers are bundling multimedia presentation along with their application to introduce their features and to walk the user through the program.
- For the software companies this will take a huge load off the technical support personnel.
- For the individual user, this means that he can learn how to use the application at

his place whenever he wants.

Multimedia in education and training:

- Multimedia is extensively used for education and training in schools, business and at home.
- Multimedia education allows one to proceed at one's own place.
- It brings presentation alive with sounds, movies and interactivity.

Multimedia on the web:

- Multimedia was introduced using languages like java and utilities like real audio or shock wave.
- Now web page display animations. Play sound, and allow the user to interact with them.

Multimedia in office work;

- Multimedia is not just for expensive commercial productions.
- It can be used to enhance ordinary communication using technologies such OLE (Object Linking Embedding) and Active X or open Doc, one can insert sound and movie objects into other application such as word processing or spreadsheet documents.

Multimedia severs and databases;

- Database called universal servers are now able to store the element that are displayed on the screen.
- Fields are used to store images, text, sounds, files and videos.
- The multimedia program draws on these stored elements to create the show these powerful databases can be occurred over network and can perform as the organizations digital library.
- These powerful databases can be occurred over network and can perform as the organizations digital library.

MULTIMEDIA TOOLS:

Introduction:

- Multimedia presentation range from simple slide show to very sophisticated and professional programs.
- The tools and techniques used for crating multimedia presentation.

Paint and draw applications:

- The still image that you see in multimedia program have been created or manipulated on a computer in a digital format.
- There are two basic forms of computer graphics bitmaps and vector graphics.

Bitmap images:

- Bitmap images are formed from a matrix of pixels with different colors.
- Bitmap images are defined by their dimensions in pixels.
- For example, 640*480 image contains 640 pixels horizontally and 480 pixels vertically.
- If you enlarge a small area of a bitmap image, you can clearly see the pixels that are used to create it.
- Each of the pixels can be a shade of gray or a color.
- Using 24-bit color, each pixel can be set to any of the 16 million colors.

To edit or modify these bitmap images one can use a paint program.

Vector graphics:

- Vector graphics are really just a set of graphical object such as lines, rectangles, ellipses, arcs or curves.
- Draw programs also called vector graphics programs.
- Draw programs have a number of advantages over paint programs such as
    - ➤ Precise control over lines and colours.
    - ➤ Ability to skew and rotate objects to see them from different angels or add perspective.

- ➤ Ability to scale objects to any size in order to fit the available space.

- When working with draw programs, one can display the images in tow views-wire frame view and shaded.
- In the wire frame view, one can see just the underlying lines in a skeletal view of the image.

GRAPHIC EFFECTS AND TECHNIQUES:

Various techniques are used to make image more realistic or interesting and to even put them in motion.

3D Graphics programs:

- Various techniques come in two basic forms.
- 2D graphics show only length and width.
- 3D graphics have depth.
- Example : 3D graphics program in Adobe dimensions.

Animation:

- The effect of action and motion is animated movies or cartoons is created by projecting still pictures called cells, one after another at a rate of 30 per second.
- Computer animation is also done by projecting a series of still images called frames.
- The science of motion called “kinematics” is the foundation for calculating movements, especially where there is more than one joint, as in arm or leg.

Shading:

- After 2D or 3D vector graphics are created in a wire frame view the next step is to add a surface to the wire frame to give the image body and solidity.
- Shades can not only add color fills but also simulate a variety of other surfaces.

Anti-aliasing:

- Anti-aliasing smooth the edges of the image by altering the contrast and color of its edge pixels.
- Thus making the contours of the image appear truer and carrier to see.

Morphing:

- Starting with photographs of a young girl and an elderly woman the morphed image can show someone with characteristic of both.
- Shows the young girl growing old.

Sound and music:

- There are two basic kinds of sounds which you can include in the multimedia presentation, sound data
- Live synthesized data

Digital sound data:

- The sound that you hear in the world around you are in the forms of analog signals.
- The analog waves are samples at evenly spaced points and the sounds at those points is measured and stored as digital values called sound data.
- When this digital data is played back, your sound card and speakers use the digital value to recreate the original analog waves.
- WAVE files are the most common file format for windows sounds.
- These files takes up lot of space-approximately 1 MB for each minute of playing time.
- These files have an extension '**.wav**'

MIDI:

- Music is actually made using a synthesizer an electronic musical instruments with attached keyboard that creates sound.
- MIDI-musical that creates sound.

- When MIDI instruments are connected to a computer loaded with the right software.
- You can store, compose, arrange, record, edit, play back and even print your music.
- Unlike WAVE file, MIDI files do not store actual sound.
- Instead they store the commands that are sent to MIDI devices to reproduce the desired sound.
- 3D sound:
- The latest audio cards are designed to simulate the theatre experience of surround sound using only two speakers called 3D sounds, these cards require speaker that support SRS (Sound Retrieval System)
- SRS is a sound recording and play back technology.

Video:

- Video is ever more widely used in multimedia in spite of computer images.
- To display movies or videos on a computer, they must first be digitized.
- To store video and to play it back at a usable rate, files are heavily compressed using a video compressor- decompressor.
- There are two basic type of compression. Lossless and Lossy:
- Lossless compression uncompressed the radio when it is played back so its quality matches the original.
- Lossy compression does not uncompress the video to the same quality as the original and some data is always lost.

Types of presentations:

- There are two basic types of multimedia presentation
    - ➤ Non-interactive
    - ➤ Interactive

- Non-interactive or linear presentations are like movies.
- Interactive is used for games, entertainment, and education.

Presentation Graphics programs:

- Easy-to-use presentation graphics programs allow typical end-users to put together multimedia shows for presentation on their own.
- To add text create outline and bulleted lists and illustrated key points using charts and graphs.

Example:

- Example of such programs are Microsoft power point, lotus freelance graphics.
- Professional development tools:
- Professional multimedia development programs called 'authoring software' give you total control over an interactive presentation.
- Some examples of these programs are macromedia director, macromedia author wave, etc.
- Electronic commerce;
- e-commerce means buying and selling of goods through e-mail.

----------UNIT IV COMPLETED-----

2marks:

1. Define e-mail.
2. How e-mail id works?
3. Define signature?
4. What is Intranet?
5. Define Morphing.

6. Define Anti-aliasing.
7. Define bit-map images.
8. Define MIDI.
9. Explain types of presentation?
10. Explain animation?
11. Define virtual reality?

5marks:

1. Explain in briefly about multimedia.
2. Explain in briefly about e-mail.
3. Explain in briefly about Intranet.
4. Explain in briefly about multimedia tools.

10marks:

1. Explain in detail about e-mail.
2. Explain in detail about Multimedia.
3. Explain in detail about Multimedia tools.

UNIT-5

ELECTRONIC COMMERCE

INTRODUCTION

When people talk about electronic commerce (e-commerce or EC), most will think of it as using the internet to help the business to market and sell the products and/or services. But in reality, e-commerce is much more than that.

Three kinds of e-commerce

- ✔ Business-to-business
- ✔ Business to customer
- ✔ Using digital middleman

BUSINESS-TO-BUSINESS E-COMMERCE

The business-to-business kind of e-commerce refers to a company selling or buying from other companies. In our context here, the company communicates with the other companies by electronic means. This is actually not new, as many businesses have already been doing it since the 80's by means of Electronic Data Interchange (EDI).

Classification of E-Commerce

There are 6 types of e-commerce systems. They are B2B, B2C, C2C, C2B, B2A, C2A. All these 6 types of e-commercethat are used today are classified based on the nature of the transaction

Types of e-commerce system :

There are 6 types of e-commerce systems. They are B2B, B2C, C2C, C2B, B2A, C2A. All these 6 types of e-commerce that are used today are classified based on the nature of the transaction.

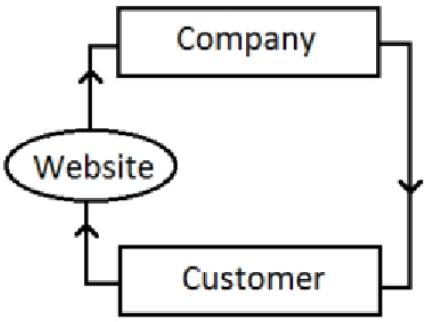
B2B (Business-to-Business)

B2B e-commerce can be simply defined as the commerce between

companies. **In** Business-to-Business type of electronic commerce system, companies do business with each other. For say, a manufacturer selling a product to a wholesaler, a wholesaler selling a product to the retailer. Here manufacturer, wholesaler and retailer all are doing their separate businesses.

B2C (Business-to-Consumer)

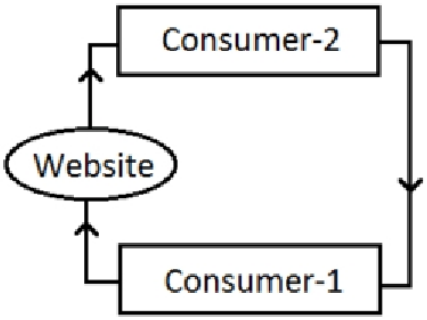
B2C model works as its name suggest. In this model, the company sells their products, goods or services directly to the consumer online. Here the customer can view products on the website that they want to buy and can order it. After receiving the order details, the company will process the order and then send the products directly to the customer. For example, Amazon, Flipkart etc are this type of e-commerce business model which we are using in our daily life.



We can view products on the websites like Amazon, Flipkart and can order it. After receiving the order, the selling company of the products processes it and send it to us. Here a business company is selling their products to the customer with the help of an e-commerce website.

C2C (Consumer-to-Consumer)

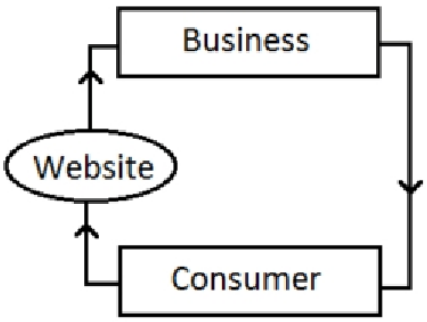
Here a consumer sells products, goods or services to other consumers using the internet or the web technologies. The C2C business model helps us to sell our assets or properties like a car, house, bike, electronics etc via online to other consumers. OLX, Quickr etc are this type of business model.



Here, if consumer-1 wants to sell a product then he/she can publish the details of the product on the website like OLX or Quickr. The consumer-2 can view the details of the product on that website that consumer-1 wants to sell. If consumer-2 is willing to buy the product that consumer-1 is selling, then the buyer can directly contact the seller and the product will be sold. Here products are selling directly from a consumer to another consumer via the website.

C2B (Consumer-to-Business)

A consumer to the business model is a type of commerce where aconsumer or end user provides a product or service to an organization. It is the reverse model of the B2C or business to consumer model, where businesses produce products and services for consumer consumption.

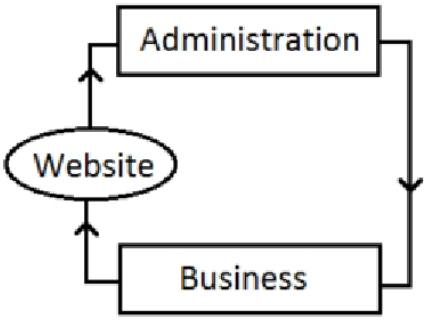


In this business model, individual customers offer to sell products or services to the companies who are prepared to purchase them. For example, if you are a software developer, then you can show a demo of your software or skills that you have on the sites

like freelancer, fiverr etc. If a company likes your software or skills then the company will directly buy the software from you or can hire you for their services.

B2A (Business-to-Administration)

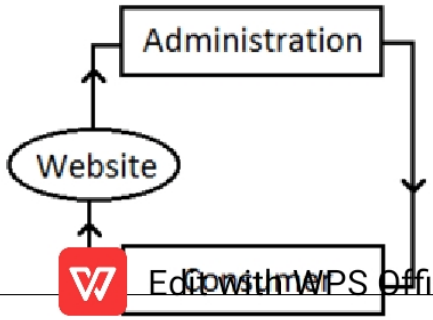
B2A or business to administration also referred as the business to government (B2G) commerce, it is a derivative of B2B e-commerce model. in this model, the businesses and government agencies (administration) use central websites to exchange information and do business with each other more efficiently than they usually can off the web.



B2G business is also referred to public sector marketing that means marketing products and services to various government levels. The B2G business network provides a platform to businesses to bid on government opportunities such as auctions, tenders and application submission etc.

C2A (Consumer-to-Administration)

Consumer to administration or consumer to government e-commerce model helps consumers to request information or post various feedbacks regarding public sectors directly to the government authorities or administration. For say, making electricity bill payments through the website government, making payment of taxes, payment of health insurance etc are C2A type of business model.



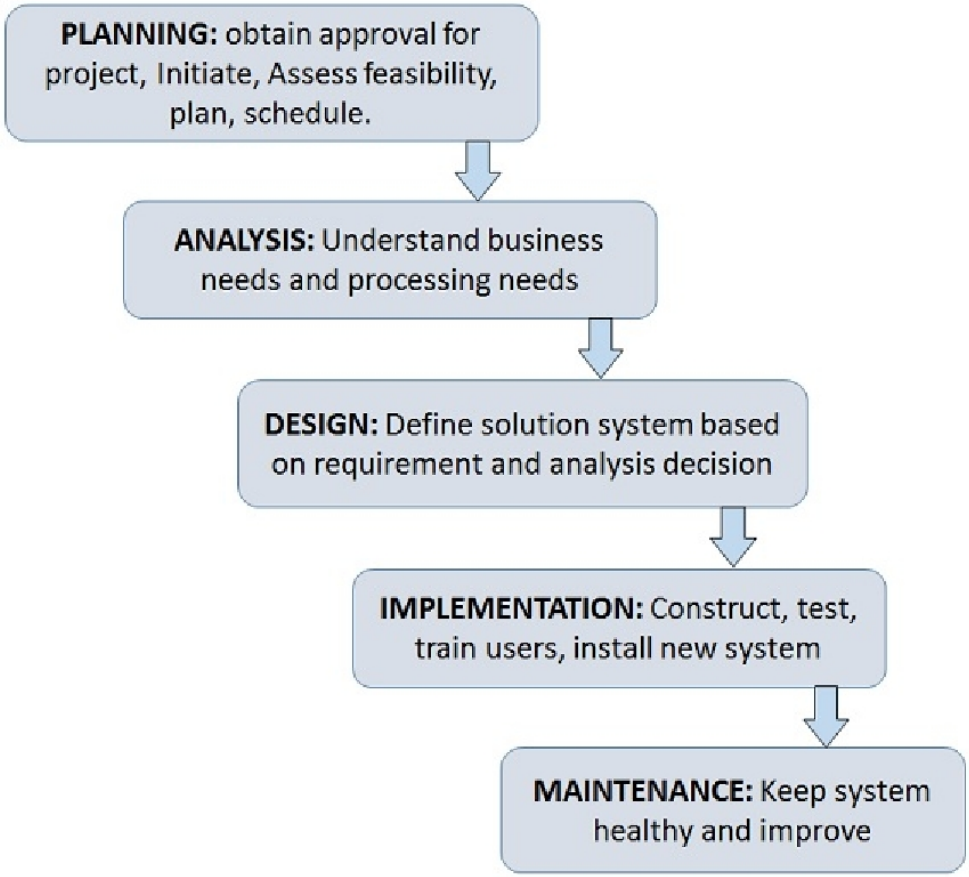
government e-commerce model provides an easy and instant solution or way to establish communication between the consumers and government.

System Analysis and Design

structured **analysis** includes data organization and structure, relational database **design**, and user interface issues. Structured **analysis** uses a series of phases, called the **systems** development life cycle(SDLC) to plan, analyze, **design**, implement, and support an **information system**

Phases of SDLC

Systems Development Life Cycle is a systematic approach which explicitly breaks down the work into phases that are required to implement either new or modified Information System.



Feasibility Study or Planning

- Define the problem and scope of existing system.
- Overview the new system and determine its objectives.
- Confirm project feasibility and produce the project Schedule.
- During this phase, threats, constraints, integration and security of system are also considered.
- A feasibility report for the entire project is created at the end of this phase.

Analysis and Specification

- Gather, analyze, and validate the information.
- Define the requirements and prototypes for new system.
- Evaluate the alternatives and prioritize the requirements.
- Examine the information needs of end-user and enhances the system goal.
- A Software Requirement Specification (SRS) document, which specifies the software, hardware, functional, and network requirements of the system is prepared at the end of this phase.

System Design

- Includes the design of application, network, databases, user interfaces, and system interfaces.
- Transform the SRS document into logical structure, which contains detailed and complete set of specifications that can be implemented in a programming language.
- Create a contingency, training, maintenance, and operation plan.
- Review the proposed design. Ensure that the final design must meet the requirements stated in SRS document.
- Finally, prepare a design document which will be used during next phases.

Implementation

- Implement the design into source code through coding.
- Combine all the modules together into training environment that detects errors and defects.

- A test report which contains errors is prepared through test plan that includes test related tasks such as test case generation, testing criteria, and resource allocation for testing.
- Integrate the information system into its environment and install the new system.

Maintenance/Support

- Include all the activities such as phone support or physical on-site support for users that is required once the system is installing.
- Implement the changes that software might undergo over a period of time, or implement any new requirements after the software is deployed at the customer location.
- It also includes handling the residual errors and resolve any issues that may exist in the system even after the testing phase.
- Maintenance and support may be needed for a longer time for large systems and for a short time for smaller systems.

Mobile Commerce

M-commerce (mobile commerce) is the buying and selling of goods and services through wireless handheld devices such as smartphones and tablets. As a form of e-commerce, m-commerce enables users to access online shopping platforms without needing to use a desktop computer.

Business on the Internet

- you're starting a small business online. I've seen thousands of people start and grow successful businesses by doing the following:
- Find a need and fill it.
- Write copy that sells.
- Design and build an easy-to-use website.
- Use search engines to drive traffic to your site.
- Establish an expert reputation for yourself.

- Follow up with your customers and subscribers with email.
- Increase your income through back-end sales and upselling.

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