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## WHAT IS AN INFORMATION TECHNOLOGY

### Changing Component or Concept of Computer

It consists of hardware software telecommunications, database management and other information processing technologies used in computer based information system

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## WHY WE NEED TO KNOW ABOUT INFORMATION TECHNOLOGY

- IT Facilitates work and become part of an Organizations
- IT is used in every field of our life
- IT offers Career Opportunities
- IT is Generally Interesting

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## INFORMATION TECHNOLOGY APPLICATIONS

It is used in every field of our life (Various Industries include )

- Manufacturing
- Pharmaceuticals and Fine Chemicals
- Chemicals & Petro-chemicals
- FMCG – home appliances, Food processing, Dairy and dairy products
- Mills - paper, pulp, board, textile,
- Leather - Tanning of leather to making of finished goods,
- Agricultural Products – grains, jute, cotton, oil seeds, plantation of vegetables, fruits,
- Heavy industries - automobiles, aircraft, ship building & maintenance, cranes.
- Constructions – bridges, dams, roads,
- Power industries – thermal, nuclear, hydro power stations,
- Merchandising, stockiest, Trading, etc.
- Insurance, Banking and Finance,
- Service industry – Hospitals, hotels, Travel and Tourism, transport.
- Film – manufacturing, distribution, production units, laboratories, editing, exhibitors,
- Gem & Jewelry – import of raw export of finished diamond, artificial diamonds, gems and stones,
- Export houses –
- Government - Ministries, Departments like defense, police, RTO, passport, visa, customs, central excise, railways, and of course the IT industry

## ORGANISATIONS AND INFORMATION TECHNOLOGY SUPPORT

How IT Support the Organisation

- INFORMATION SYSTEM INFRASTRUCTURE AND ARCHITECTURE
- ORGANISATION STRUCTURE AND IT SUPPORT
- EVOLUTION AND TYPE OF INFORMATION SYSTEM
- IT SUPPORT AT DIFFERENT ORGANISATIONAL LEVELS
- MANAGEING INFORMATION TECHNOLOGY IN ORGANISATION ( Role of ISD )

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## ORGANISATIONS AND INFORMATION TECHNOLOGY SUPPORT

### ▪ INFORMATION SYSTEM INFRASTRUCTURE AN ARCHITECTURE

#### Information Infrastructure

It consists of the physical facilities, services and management that support all computing resources in an organization.

#### Information Architecture

It is high level map or plan of the information requirements in an organization and the manner in which these requirements are being satisfied. It is guide for current operations and a blueprint for future direction.

#### Traditional Architecture

It include three categories, the mainframe environment, a PC environment and the combination of these two which create third type that is the Distributed environment.

#### New Architecture

Client / Server architecture, Enterprise wide architecture

Internet based architecture (Integrating departmental and corporate IS resources through LAN / WAN),

## ORGANISATIONS AND INFORMATION TECHNOLOGY SUPPORT

### ▪ ORGANISATION STRUCTURE AND IT SUPPORT

#### THE ORGANISATION STRUCTURE

The Hierarchical organizational Structure

The Flat organizational Structure

The Project Organizational Structure

The Matrix Organizational Structure

#### THE CORRESPONDING INFORMATION SYSTEMS

Application Systems

Departmental Information Systems

Plant Information Systems

Divisional Information Systems

Enterprise wide Information Systems

Interorganisational Information System

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## **ORGANISATIONS AND INFORMATION TECHNOLOGY SUPPORT**

- **EVOLUTION AND TYPE OF INFORMATION SYSTEM  
SUPPORT DIFFERENT ORGANIZATIONAL LEVEL**

Transaction Processing System  
Management Information System  
Decision Support System  
Group Decision Support System  
Executive Support System  
Office Automation System

## **ORGANISATIONS AND INFORMATION TECHNOLOGY SUPPORT**

### **MANAGEING INFORMATION TECHNOLOGY IN AN ORGANISATION**

**Role of Information System Department  
( ISD )**

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## **What is Role of the Information System Department ?**

( TRADITIONAL MAJOR ISD FUNCTIONS )

- System Development &  
System Project Management
- Management EDP/MIS Department including  
Staffing , Training
- Developing Information System Skills,  
Providing end user support & Technical Services.

## **NEW ( ADDITIONAL ) MAJOR Information System Department functions**

- Initiating and designing specific strategic information system
- Infrastructure planning development and control
- Incorporating the Internet and Electronic Commerce into the Business
- Managing System Integration Including the Internet , Intranets, Extranet
- Educating the Non - IS Managers about IT & IS Staff about the Business
- Supporting end users computing
- Proactively using business and technical Knowledge to seed the line with  
innovative ideas about Information Technology
- Creating Business alliances with vendors and IS department in other  
organization.

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## Evolutionary path of computer based information system

1940	Scientific , Military Applications
1950	Routine Business Applications , TPS
1960	MIS , Office Automations
1970	DSS , LANs
1980	Client / Server, EIS , PC's , AI , Groupware
1990	Website, Internet , Intranet/Extranet , ERP

## COMPUTER HARDWARE

- THE CENTRAL PROCESSING UNIT
- COMPUTER MEMORY
- COMPUTER HIERARCHY
- INPUT TECHNOLOGIES
- OUTPUT TECHNOLOGIES

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## BASIC OPERATIONS OF COMPUTER HARDWARE SYSTEMS

- INPUTTING
- STORING
- PROCESSING
- OUTPUTTING
- CONTROLLING

## THE CENTRAL PROCESSING UNIT

### ▪ WHAT IS CPU ?

- Central Processing Unit perform actual computation
- The CPU is a Microprocessor ex. Pentium IV
- The Microprocessor has different portions which perform different functions:
  - The Control Unit (CU) – Controls the flow of information
  - Arithmetic Logic Unit (ALU) – Performs Arithmetic logic operations
  - Registers – Store small amount of data & instructions for short period of time.

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## HOW DOES A COMPUTER PROCESS DATA

- **Batch Processing** : Changes and queries to file are stored for a period of time and then a processing is done periodically. Batch processing can be made on a schedule basis such as Daily, Weekly or Monthly or on an required basis.
- **Immediate Processing** : Transactions are processed immediately or shortly after a transaction or real world event occurs. It is also called **real time or on line processing**. Such application can immediately capture data about ongoing events or processes and provide the information.

Example : Air Line Reservation System

## STRATEGIES OF DATA PROCESSING

- **CENTRALISED DATA PROCESSING** :  
Processing alternative in which all processing occurs in a single location or facility. This approach offers the highest degree of control.
- **DISTRIBUTED DATA PROCESSING** :  
Processing alternative in which computer are placed at remote locations but connected to each other via telecommunications devices.
- **DECENTRALISED DATA PROCESSING** :  
Data Processing is done at the devices placed at various remote location. The individual computer system are isolated and do not communicated each other. Decentralized system are suitable for companies that have independent operating division.

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## COMPUTER MEMORY

### ▪ MEMORY CAPACITY

8 Bit = 1 Byte

1024 Bytes = 1 Kilo Bytes

1024 Kilo Bytes = 1 Megabyte (  $1024 \times 1024$  )

1024 Mega Byte = 1 Gigabyte (  $1024 \times 1024 \times 1024$  )

1024 Gigabyte = 1 Terabyte ( One trillion bytes)

## COMPUTER MEMORY

### ▪ PRIMARY MEMORY( Main Memory or primary Storage )

#### ▪ It stores for very brief periods of time three types of information

- Data to be processed by the CPU
- Instruction for the CPU as to how to process the data
- Operating system programs that manage various aspects of the Computers operation

Registers

Random Access Memory ( RAM )

Read Only Memory (ROM ) ( PROM, EPROM, EEPROM )

Cache Memory – Type of memory which is closer to the CPU than is RAM, where the computer can temporarily store blocks of data used more often

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## COMPUTER MEMORY

- **SECONDARY MEMORY ( Secondary Storage )**
  - It is designed to store very large amounts of data for extended periods of time
  - It is Nonvolatile
  - It takes much more time to retrieve data from secondary storage than it does from RAM.
  - It is much more cost effective than primary storage
  - It can take place on a variety of media, each with its own technology as discussed below such as
- Magnetic Media :** Magnetic Tape, Magnetic Disks , Hard Drives  
Floppy Disks
- Optical Storage Devices ( Three types)**
- CD-ROM ( compact disk read only memory )
  - WORM ( Write once read many )
  - Rewritable CDs

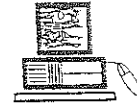
## BASIC TWO TYPES OF COMPUTERS

- **DIGITAL COMPUTERS :**  
Process information which is essentially in a binary or two-state form, namely zero and one. We mostly refer to the digital type of electronic machines  
Digital computers fall into ranges called microcomputers, minicomputers, mainframes and supercomputers, classified in ascending order of size – small, medium, large and very large.
- **ANALOG COMPUTERS**  
Represent numbers by a physical quantity : that is they assign numeric value by physically measuring some actual property such as amount of voltage passing through a point in an electric circuit , temperature, pressure etc.  
Such computers handle or process information which is of a physical nature.

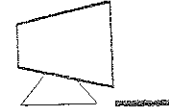
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## Computer Terminology

This is a Standalone Personal Computer  
PC's have intelligence built into them  
PC's have local storage & processing capability



This is a Terminal  
Terminals DO NOT have intelligence  
Storage & processing at the Server



If a Terminal is intelligent (PC) it is called  
Workstation, and if a Terminal is NOT intelligent  
it is called a Dumb Terminal

## CLIENT SERVER ARCHITECTURE

- A form of distributed processing in which several computers share resources and are able to communicate with many other computers ; a client is a computer used to access shared network resources and a server is a machine that is attached to the same network that provides client with these services.

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## COMPUTER HIERARCHY

- COMPUTER HIERARCHY
- SUPERCOMPUTER
- MAINFRAME COMPUTERS
- MINICOMPUTERS
- WORKSTATIONS
- MICROCOMPUTERS
- LAPTOP AND NOTEBOOK COMPUTERS

## COMPARISON (LARGER AND DESKTOP COMPUTERS)

TYPE	PROCESSOR	AMOUNT OF RAM	PHYSICAL SIZE	COMMON ROLE / USE
Supercomputer	60 Billion to 3 Trillion MIPs	8,000 MB+	Like a car	Scientific calculation, complex system modeling / Simulation
Mainframe	40-4,500 MIPs	256-1024 MB	Like a Refrigerator	Enterprisewide System, Corporate Database Management
Minicomputer	25-100 MIPs	32-512 MB	Like a file cabinet	Department level or small company or dedicated to particular system ( e.g. e-mail )
Workstation	50-100 MIPs	32-256 MB	Desktop	Engineering / CAD , Software Development
Microcomputer	5-20 MIPs	16-128 MB	Desktop	Personal / Workgroup Productivity , communication
Network Computer	1-5 MIPs	4-16 MB	Desktop	Personal / Workgroup Productivity , communication

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## INPUT TECHNOLOGIES

- **Mouse , Keyboard , Light pen or stylus, Touch Screen :**  
Data are usually entered with one or more of these tools.
- **Bar code reader or scanner :**  
The data entered are stored as printed bars of different widths.
- **Optical Scanner :**  
The data entered are stored on type pages or even handwritten forms and entertain.

## INPUT TECHNOLOGIES

- **Magnetic ink character reader :**  
The data entered are imprinted with magnetic ink.  
This system is mostly used on bank checks.
- **Voice Recognition :** Voice input is entered, interpreted and displayed on a screen or saved to disk.
- **Digitizer :** Graphic images are digitized and transmits them to the computer.
- **Camera Tape Recorder :** Video, photos, graphics, sound and text can be entered to create multimedia presentations that educate, inform and entertain.

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## OUTPUT TECHNOLOGIES

- **PRINTER**  
The printer prints reports , fills in forms and prints high quality graphics.
- **MONITOR**  
Keyed computer stored or computer produce information are displayed.
- **PLOTTER**  
This draws computer produced color graphics and charts
- **AUDIO RESPONSE**  
User get verbal messages or music and they can create sound and voice overlays for multimedia presentations.
- **IMAGE PROCESSING EQUIPMENT**  
Documents , photos , graphics , videos, animations and sound can be stored on film compact disk or laser disk.

## TYPES OF PRINTERS

### IMPACT PRINTERS :

It uses a hammer to hit the ribbon or paper to form the characters or images and mechanism resembles those of typewriter. These printers used with microcomputers of this category are

#### Daisy wheel printers :

It has removable print wheel consisting of spokes ends with characters.

#### Dot Matrix Printer :

A dot matrix printer contains a print head of small pins that strike an inked ribbon forming characters or images prints heads are available with 9,18,24 pins. There is another type of printer in this category is **line printer**.

### NON IMPACT PRINTERS :

They form images and characters without making direct physical contact between printing mechanism and paper. These printers use chemicals , lasers and heat to form the images on the paper.

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## TYPES OF PRINTERS

### Types of Non Impact Printers

TYPE	TECHNOLOGY	ADVANTAGES	DISADVANTAGES
LASER	Images are created on drum treated with a magnetically charged ink like toner ( powder). The images are then transferred to paper It is Similar to Prototyping machine	Quiet , excellent quality , output of text and graphics , very high speed 4-25 PPM –Page Per Minute	High cost especially for color
INK JET	Electrically charged drops hit paper	Quiet , prints, colour , text and graphics less expensive fast, 1-4 PPM	Relatively slow
THERMAL	Temperature sensitive paper changes colour when treated , characters are formed by selectively heating print head.	Quit high quality colour output of text and graphics can also produce transparencies 4-5 PPM	Special paper required expensive slow

## COMPUTER GENERATIONS

### GENERATIONS OF COMPUTERS

- FIRST GENERATION OF COMPUTER ( 1951-1958 )
- SECOND GENERATION OF COMPUTER ( 1959-1964 )
- THIRD GENERATION OF COMPUTER ( 1965-1971 )
- FOURTH GENERATION OF COMPUTER ( 1971-present )
- FIFTH GENERATION OF COMPUTER ( Future computers since 1985 )

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## GENERATIONS OF COMPUTERS

### MAJOR TRENDS IN COMPUTER CHARACTERISTICS AND CAPABILITIES

Particular	First generations	Second Generations	Third Generations	Fourth Generations	Fifth Generations
Size ( Typical Computers )	Room size Mainframe	Closet size Mainframe	Desk size Minicomputer	Desktop and Laptop Microcomputers	Credit card size Micro
Circuitry	Vacuum Tubes	Transistors	Integrated Semiconductor Circuits	Large Scale Integrated (LSI) semiconductor circuits	Very Large Scale Integrated (VLSI) superconductor circuits
Density (Circuits per component )	One	Hundreds	Thousands	Hundreds of thousands	Millions
Speed ( Instructions / seconds )	Hundreds	Thousands	Millions	Tens of Millions	Billions
Reliability ( Failure of circuits )	Hours	Days	Weeks	Months	Years
Memory ( Capacity in Characters )	Thousands	Tens of thousands	Hundreds of thousands	Millions	Billions

## MULTIMEDIA SYSTEM

- A microcomputer that incorporates text, graphics, sound, video and animation in single digital representation.
- Multimedia is the convergence of computer with video, film, sound, graphics animation, photos and text . The various media are digitized so that a computer can understand and manipulate them , allowing the user to control the presentation of information.

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## MULTIMEDIA APPLICATIONS

- **Commercial Applications :**  
Includes corporate training , portable sales tools
- **Consumer & Home Entertainment :**  
Includes Computer games, film making, Music recording
- **Government :**  
Training employees creation of database & archives
- **One can create 3-D effects and Design**
- **Building Business presentations** that includes sound effects, music , pictures, animations , video and text.
- **Create animated Creating Cards**
- **Explore medical terminology** using pictures and animations to help out with the hard parts.

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# THANK YOU

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