KASNEB - DICT

Introduction to Computing

LEVEL 1: PAPER NO. 1

Contents

SAMPLE NOTES

TOPIC 1

INTRODUCTION TO INFORMATION COMMUNICATION TECHNOLOGY

Introduction

A **computer** is an electronic device that takes in data and instructions (input), works with the data (processing), and produces information (output).

Basic Terms

Data refers to the raw facts that are fed to a computer.
Information is data that has been processed and can be used for decision making.
Data and Information can take either of the following formats:
•**Text** – These are number, characters or special symbols. They are used when preparing reports, letters, etc.
•**Graphics** – These are images. Used when preparing charts, graphs, pictures
•**Multimedia** – These are audio and video recordings that may or may not combine of text and graphics.

Processing is the act of converting data into information.

A typical personal desk top computer

History and Development of Computers

Overview

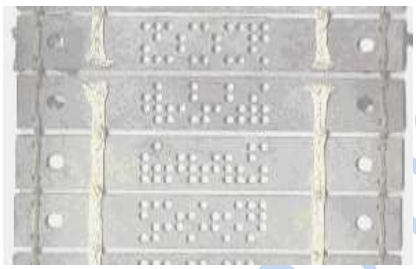
Nothing epitomizes modern life better than the computer. For better or worse,computers have infiltrated every aspect of our society. Today computers do much more than simply compute: supermarket scanners calculate our grocery bill while keeping store inventory; computerized telphone switching centers play traffic cop to millions of calls and keep lines of communication untangled; and automatic teller machines (ATM) let us conduct banking transactions from virtually anywhere in the world. But where did all this technology come from and where is it heading? To fully understand and appreciate the impact computers have on our lives and promises they hold for the future, it is important to understand their evolution.

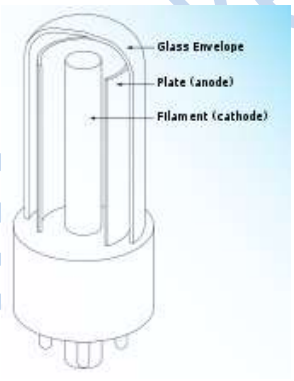
Five Generations of Modern Computers

First Generation Computers - 1940-1956: Vacuum Tubes

These computers used **vacuum tubes** for circuitry and **magnetic drums** for memory,were enormous, taking up entire rooms. Data Input was based on **punched cards** and paper tape.The UNIVAC and ENIAC computers are examples of first-generation computing devices.

A Photograph of ENIAC





Vacuum tube

First generation computers were characterized by the fact that operating instructions were made-to-order for the specific task for which the computer was to be used. Each computer had a different binary-coded program called a machine language that told it how to operate. This made the computer difficult to program and limited its versatility and speed. Other distinctive features of first generation computers were the use of vacuum tubes (responsible for their breathtaking size) and magnetic drums for data storage.

Second Generation Computers (1956-1963):Transistors

The 1959 to 1963 era saw the development of the second generation of computers. This was the time when transistors were developed and introduced in to the internal circuitry of the computer thus replacing the vacuum tubes.

A **transistor** is a signal bridge that amplifies and transmits electronic signal from one point to the other. The transistors were smaller than vacuum tubes and this greatly reduced the overall size of computer. The transistors produced less heat and therefore failed less frequently. The computer therefore became more reliable, smaller in size and significantly faster than first generation computers.

A Transistor

IBM Stretch computer of 1959

Third Generation Computers (1964-1971):Integrated Circuits

Though transistors were clearly an improvement over the vacuum tube, they still generated a great deal of heat, which damaged the computer's sensitive internal parts.
The development of **integrated circuit chip** •Transistors were miniaturized and placed on **silicon chips**, called semiconductors. This Increased the speed and efficiency of computers. It is important to note that Instead of punched cards and printouts, input was done through **keyboards** and **monitors.**

They also used an **operating system**, which allowed the device to run many different **applications** at one time. Computers became accessible to a mass audience because they were smaller and cheaper than their predecessors.

Integrated circuit

Fourth Generation (1971-Present): Micro Processors

After the integrated circuits, the only place to go was down - in size, that is. Large scale integration (LSI) could fit hundreds of components onto one chip. By the 1980's, very large scale integration (VLSI) squeezed hundreds of thousands of components onto a chip. Ultra-large scale integration (ULSI) increased that number into the millions. The ability to fit so much onto an area about half the size of a U.S. dime helped diminish the size and price of computers. It also increased their power, efficiency and reliability. The Intel 4004 chip, developed in 1971, took the integrated circuit one step further by locating all the components of a computer (central processing unit, memory, and input
and output controls) on a minuscule chip. Whereas previously the integrated circuit had had to be manufactured to fit a special purpose, now one microprocessor could be manufactured and then programmed to meet any number of demands. Soon every day household items such as microwave ovens, television sets and automobiles with electronic fuel injection incorporated microprocessors.

Such condensed power allowed everyday people to harness a computer's power. They were no longer developed exclusively for large business or government contracts. By the mid-1970's, computer manufacturers sought to bring computers to general consumers.

These minicomputers came complete with user-friendly software packages that offered even non-technical users an array of applications, most popularly word processing and spreadsheet programs. Pioneers in this field were Commodore, Radio Shack and Apple Computers. In the early 1980's, arcade video games such as Pac Man and home video game systems such as the Atari 2600 ignited consumer interest for more sophisticated, programmable home computers.

In 1981, IBM introduced its personal computer (PC) for use in the home, office and schools. The 1980's saw an expansion in computer use in all three arenas as clones of the IBM PC made the personal computer even more affordable. The number of personal computers in use more than doubled from 2 million in 1981 to 5.5 million in 1982. Ten years later, 65 million PCs were being used. Computers continued their trend toward a smaller size, working their way down from desktop to laptop computers (which could fit inside a briefcase) to palmtop (able to fit inside a breast pocket). In direct competition with IBM's PC was Apple's Macintosh line, introduced in 1984. Notable for its user friendly design, the Macintosh offered an operating system that allowed users to move screen icons instead of typing instructions. Users controlled the screen cursor using a mouse, a device that mimicked the movement of one's hand on the computer screen.

As computers became more widespread in the workplace, new ways to harness their potential developed. As smaller computers became more powerful, they could be linked together, or networked, to share memory space, software, information and communicate with each other. As opposed to a mainframe computer, which was one powerful computer that shared time with many terminals for many applications, networked computers allowed individual computers to form electronic co-ops. Using either direct wiring, called a Local Area Network (LAN), or telephone lines, these networks could reach enormous proportions. A global web of compute

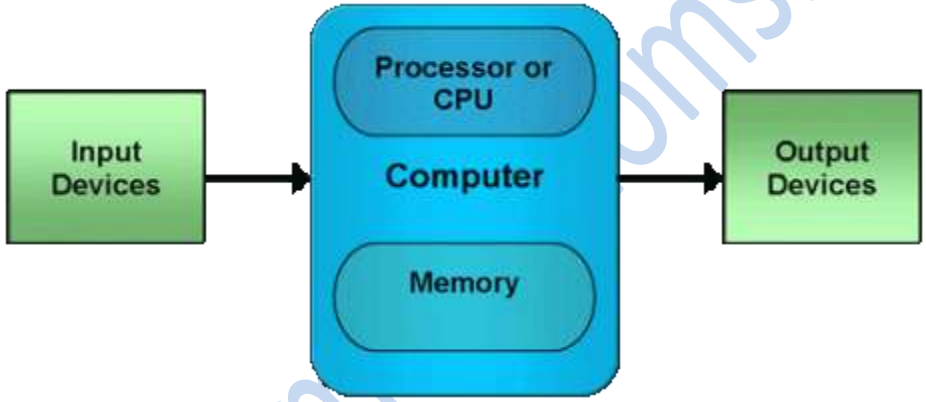
TOPIC 2

COMPUTER HARDWARE

The term hardware refers to the tangible parts of a computer system, that is, the physical equipment of the computer.

The hardware Components

The internal architectural design of computers differs from one system model to another. However, the basic organization remains the same for all computer systems. The following five units (also called ***"The functional units"***) correspond to the five basic operations performed by all computer systems.



There are 4 primary parts to a computer system:

1. **Input devices**
   Input devices allow a person to communicate information to the computer. Examples of input devices would be a keyboard and mouse.

2. **Output devices**
   Output devices communicate information to the user. Examples of output devices would be a monitor or printer.

3. **CPU [Central Processing Unit]**
   Central Processing Unit (CPU) performs all the arithmetic and logical calculations in a computer. The CPU is said to be the brain of the computer system. It reads and executes the program instructions, perform calculations and makes decisions. The CPU is responsible for storing and retrieving information on disks and other media.

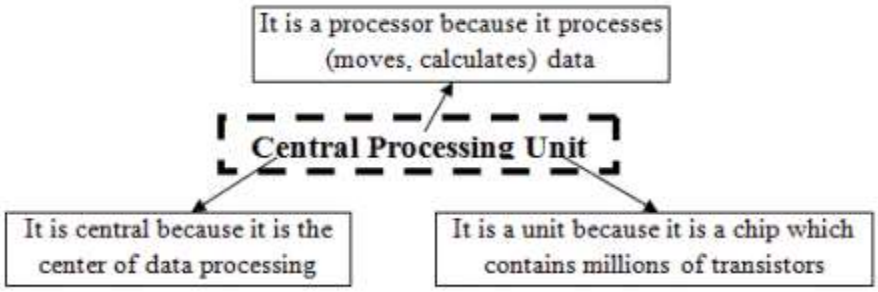


Figure: Meaning of CPU

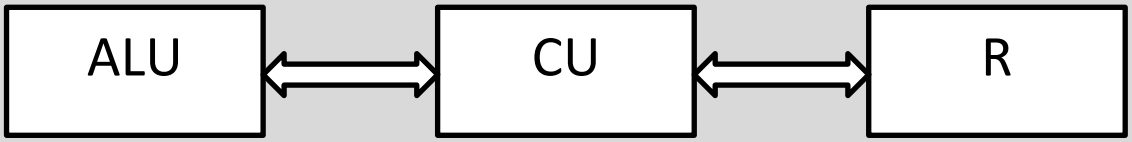
There are three major parts to the CPU: the CU, the ALU, and the registers.

Control Unit: The control unit issue control signals to perform specific operation and it directs the entire computer system to carry out stored program instructions

Arithmetic and Logic Unit: The ALU is the 'core' of any processor. It executes all arithmetic operations (addition, subtraction, multiplication and division), logical operations (compare numbers, letters, special characters etc.) and comparison operators (equal to, less than, greater than etc.).

Register Set: Register set is used to store immediate data during the execution of instruction. This area of processor consists of various registers.

Computer processor structure Summary



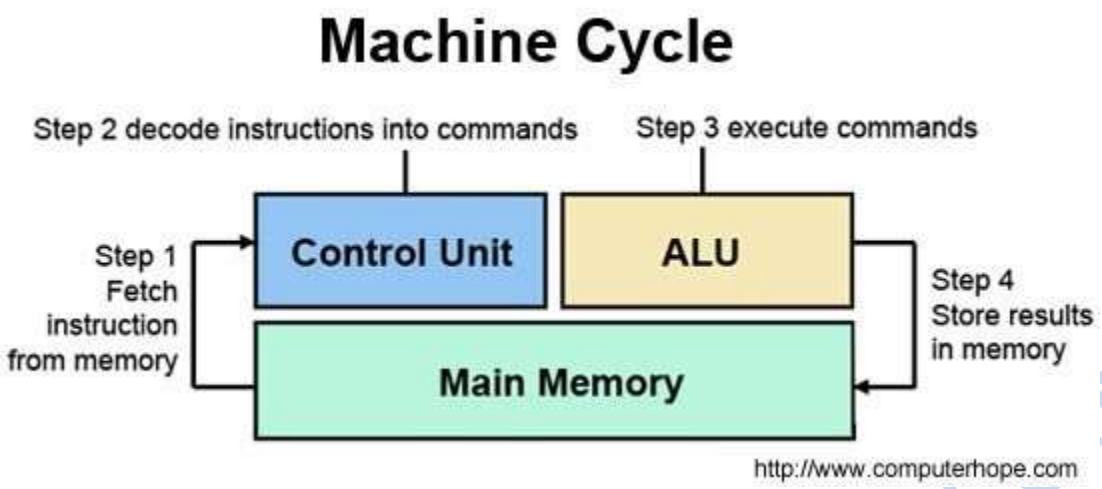
CU (Control unit) – Reads an instruction in R, decode it and fetch data in the R as recurred and gives to the ALU with direction on what to do to the data.

ALU (Arithmetic and Logic Unit) – takes data and direction from CU and works on the data to produce the desired results

R (Register) – small memory in the Processor that holds what the computer is working on immeditry

Machine cycle

The steps performed by the computer processor for each machine language instruction received. The **machine cycle** is a 4 process cycle that includes reading and interpreting the machine language, executing the code and then storing that code.



Four steps of Machine cycle

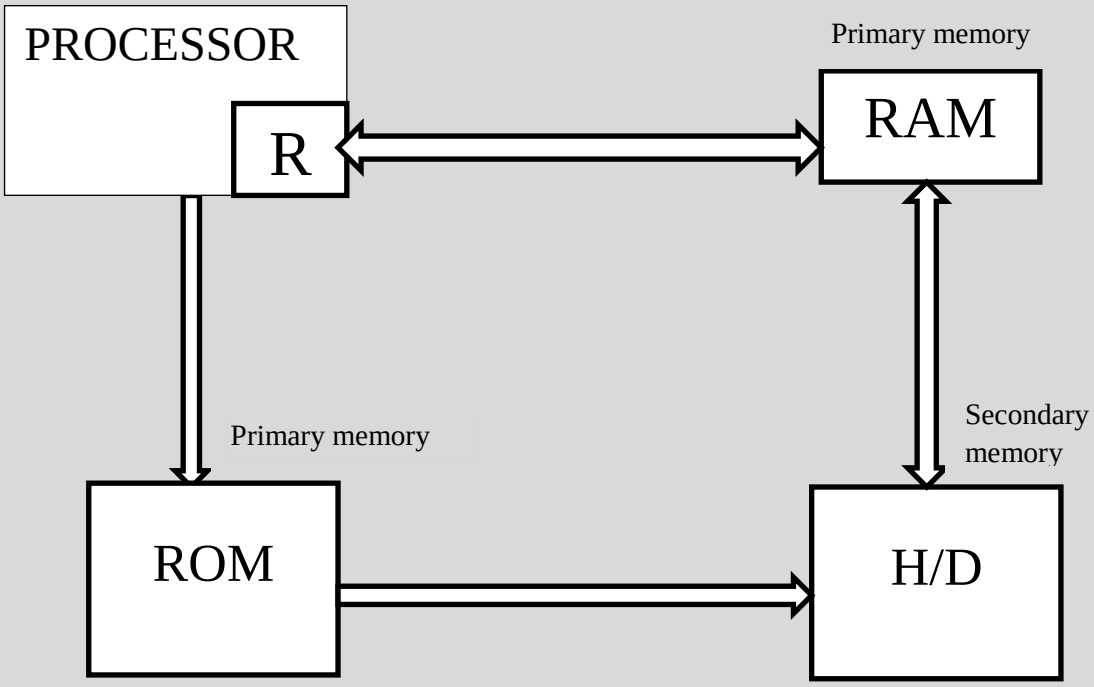
1. **Fetch** - Retrieve an instruction from the memory.
2. **Decode** - Tranlate the retrieved instruction into a series of computer commands.
3. **Execute** - Execute the computer commands.
4. **Store** - Sand and write the results back in memory.

Instruction cycle

The sequence of operations that the cpu has to carry out while execution is called instruction cycle.

- 1:- Read an Instruction
- 2:- Decode the instruction
- 3:- Find the address of operand
- 4:- retrieve an operand
- 5:- perform desired operation
- 6:- find the address of destination
- 7:- store the result into the destination

Computer processor operation with memory



PROCESSOR: responsible for all computations/data execution, it takes/fetches data from RAM onto the Register and works on it

PRIMARY MEMORY: These are the memory which the computer has direct access to/direct connects to, we have two Primary memories, RAM and ROM

RAM - holds data and program fetched by processor from secondary memory temporary as it awaits its immediate use

ROM – the content of ROM is BIOS (Basic Input/output System) program; the program is responsible for two responsibilities at computer Booting processes /computer start up processes

1. Checks that the computer basic input/output devices are working properly
2. Direct the computer processor on how to load the OS (Operating System)
The operating system is the computer software that manages all computer operations; it gives total direction to computer processor on how to do all operation. NOTE**:** The Processor works with the direction of operating system and when it's not loaded, the computer processor is primitive (can't do anything)

SECONDARY MEMORY: These are the memory which the computer has no direct access to/ connects to the memories under their responsible memory controllers; we have several secondary memories and

may be classified according to the technologies by which they works, H/D (Hard Disk/Local Disk) is the main secondary memory in a computer.

NOTE: the secondary memory/ secondary storage hold data/reserve data after use by the computer processor. It holds data permanently for future use

4. Memory storage

There are two types of memory: primary memory and secondary memory.

Primary Memory

Primary memory is the RAM (Random Access Memory) of a computer. It is temporary storage space for data when the computer is in a power-on state. It is much slower than the registers in the CPU, but there is a lot more of it (more data storage capacity). Primary memory holds both data and programs (once they are loaded for execution). (ROM, or Read Only Memory, could also be considered primary memory, but there is usually a lot less ROM than there is RAM. The difference between ROM and RAM is that data cannot be written to ROM.)

Primary memory is like a table of **addresses** and **contents**. Also, 4 or 8 bytes (depending on the CPU-type) is grouped together to form **words.**

Secondary Memory

Secondary memory is what the disk drives are – places data can be stored and kept there even after the computer is turned off.

Types of secondary storage

Data storage has evolved in recent years, and storage devices can vary in cost, performance, size and storage space quite a bit.

a) Magnetic Storage Device
Hard drives are the primary storage device in most personal computers. Hard drives use magnets to record data on rotating metal platters.

Benefits of Magnetic Storage Devices: Solid state drives are the only drives that are faster than hard drives; however the cost to store date is pennies per gigabyte.

Advantages of Magnetic Storage Devices

- Inexpensive storage
- Very fast access to data
- Direct access on any part of the drive
- Very large amounts of storage space

Disadvantages of Magnetic storage devices

- Data can be altered by magnetic fields, dust, mechanical problems
- Gradually lose their charge over time - data lost
- Hard disks eventually fail which stops the computer from working
- The surface of the disk, can lose data within sectors with regular crashes
- Cannot transfer the disk to another computer easily

b) Optical Storage Device

Optical drives include CD's, DVD's and Blu-ray disks and they all use a lens to read and write information. CD-R, DVD-R, BD-R can be written to once and are then Read only, while CD-RW, DVD-RW, BD-RW are Read Write so they can be written many times.

Benefits of Optical Storage Devices: CD's, DVD's and Blu-ray disks are great to record music, movies, games, and software applications. It seems with optical storage an advantage can also be a disadvantage depending on how they are being used.

Advantages of Optical Storage Devices

- Optical discs are portable and can be read on many different devices
- Very inexpensive
- Memory is retained even when the power is turned off
- Durable and last a long time
- Archived data cannot be overwritten on read only CD-R, DVD-R, BD-R formats
- Can random access data no matter where or when it was stored

Disadvantages of Optical Storage Devices

- Require special drives to read/write.
- Compared to other storage devices they have little storage
- Can be expensive per GB/TB
- There are compatibility issues with different drives
- Lack of standards for grading quality and for longevity tests
- You can write once on read only CD-R, DVD-R, BD-R formats

c) Solid State Storage Device *(SSD)*

Solid state drives use flash memory and could possibly make conventional hard drives obsolete. They are compatible with SATA or SAS, and use standard form factors of 3.5-, 2.5- or 1.8-inch.

Benefits of Solid State Storage Devices: Solid State Storage Devices are durable, reliable, have a long service life and they can rewrite and erase data very often.

Advantages of Solid State Storage Devices

- Startup faster due to no spin-up and they are faster than magnetic hard drives
- When seeks on the hard disk seeks are limited they have faster launch times
- They last longer and some are waterproof

- All data stored can be scanned quickly for security purposes

Disadvantages of Solid State Storage Devices

- Solid State Storage devices are expensive
- Vulnerable to abrupt power loss, magnetic fields, and electrical and static charges
- Limited writes cycles wear out after 100,000-300,000
- High endurance
- Larger erase blocks make random write speeds slow

Communication Devices

A **communication device** is a hardware device capable of transmitting an analog or digital signal over the telephone, other communication wire, or wirelessly.

TOPIC 4

BASIC DATA PROCESSING

Introduction to Data Processing

Data processing is simply the conversion of raw data to meaningful information through a process. Data is manipulated to produce results that lead to a resolution of a problem or improvement of an existing situation. Similar to a production process, it follows a cycle where inputs (raw data) are fed to a process (computer systems, software, etc.) to produce output (information and insights).

Generally, organizations employ computer systems to carry out a series of operations on the data in order to present, interpret, or obtain information. The process includes activities like data entry, summary, calculation, storage, etc. Useful and informative output is presented in various appropriate forms such as diagrams, reports, graphics, etc.

Stages of data processing:

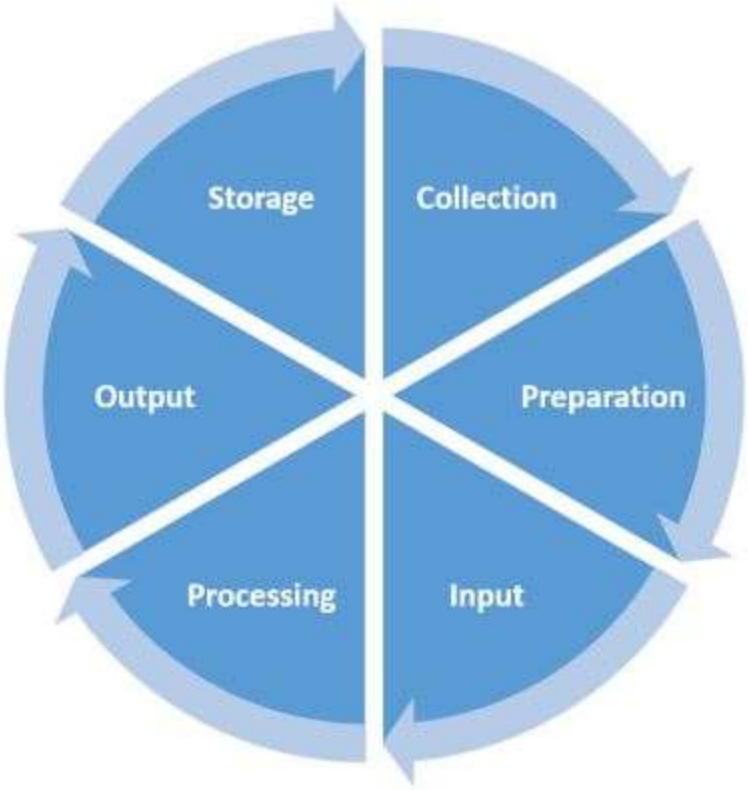
1. **Input** – The raw data after collection needs to be fed in the cycle for processing. This is considered the first step and called input.
2. **Processing** – Once the input is provided the raw data is processed by a suitable or selected processing method. This is the most important step as it provides the processed data in form of output which will be used further.
3. **Output** -This is the final outcome and the raw data provided in the first stage is now "processed" and the data is useful and provides information and no longer called data

Data Processing Cycle

Data processing cycle as the term suggests **is sequence of steps or operations for processing data** i.e. processing raw data to usable form.

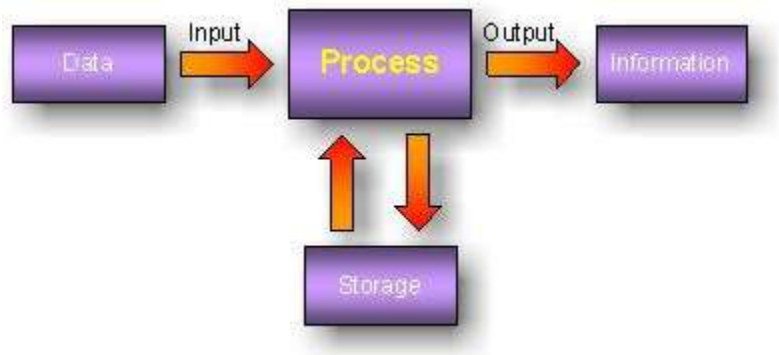
Stages of the Data Processing Cycle

As discussed earlier **data processing have 3 broad stages** which have sub stages or steps involved. These are the steps/ process required in between these 3 broad stages.



a. **Data Collection:** This is the first step which will provide the data for the input. Collecting data is a hard work in its own but is most essential on which the results depend. The quality of input will determine the quality of output. This data collection can be done in various ways by primary or secondary sources.This data may include census data, GDP or other monetary figures, data about number of industries, profit of a company etc. Depending upon the data requirement its source must be identified from which data will be collected.
b. **Preparation/ Sieving:** Some people consider this as a part of processing but does not involve any processing. Preparation include sorting and filtering of data which will finally be used as input. This stage required you to remove the extra or unusable data to make processing faster and better. This is a broad step in reducing the quantity of data to yield better result.
c. **Input:** This is feeding of raw and sieved data for purpose of processing. If input is not done properly or done wrong then the result will be adversely effected as software follow the rule of "Garbage in – garbage out". Utmost care should be taken to provide right data.
d. **Processing:** This is the step where data is processed by mechanical or automated means. The processed data is one which gives information to the user and can be put to use. The raw data cannot be understood and thus needs processing which is done in this step. Processing of data may take time depending on the complexity of the data and the volume of data which is provided as input. The step of preparation mentioned above helps in making this process faster.
e. **Output/ Result –** This is the last step of data processing cycle as the processed data is delivered in form of information/results in this step. Once the result or output is received it may further be processed or interpreted by the user or software for further value addition. This output can also be used directly in presentations or the records. This output may even be saved as be used as a input for further data processing which then becomes a part of cycle

which is being discussed.If this data is not used as input then this complete process cannot be considered as cycle and will remain to be a one time activity of data processing. For using this data as input it must be stored or simultaneously be available for further processing.



All these steps or stages have a **particular sequence which must be followed** if processing is done manually as the **automatic processing have inbuilt algorithms with pre-defined steps**. In automatic processing the chances of error are drastically reduced but this happens only when the input is a correct data or data set.

Most of the programs being used today which process data completely or partially processes it have a back-end with pre-defined algorithm and sets of operation. If a single software performs all the required steps than it is considered to have a complete data processing cycle in its back-end whereas few steps of complete cycle might exist. In case of partial data processing, a combination of different set of hardware and software need to be used so as to complete the cycle. It becomes the responsibility of the person operating this set to feed and receive the output in a particular sequence.

Limitations of data processing cycle (what not to expect)

Data processing cycle in most of the cases is a complete cycle in itself but as mentioned above a set of hardware and software might also be employed in some cases with special needs. In such cases a number of things needs to be taken care of to get the sensible and useful output. This depends on the correct sequence, operating skills, understanding of the steps forming the cycle, partial output from one part which will be used as a input for next part. If a person/operator/machine or software fails to perform the steps in sequence than the output will not be useful at all.

Methods of data collection

Methods of data collection are essential for anyone who wish to collect data. Data collection is a fundamental aspect and as a result, there are different methods of collecting data which when used on one particular set will result in different kinds of data. Collection of data refers to a purpose gathering of information and relevant to the subject-matter of the study from the units under investigation. The method of collection of data mainly depends upon the nature, purpose and the scope of inquiry on one hand and availability of resources, and the time to the other. The statistical Data may be classified into primary and secondary depending upon the nature and

mode of collection.
Data collection is a very important part of science. Meteorologists data related to weather over time to keep an record and makes forecasts on basis of it. Other example include Oceanographers collecting data on the salinity (saltiness) of seawater studying changes in trends of our Earth's oceans. Although have been collected by hand for thousands of years, the technology to collect data electronically has been around for fewer than 80 years and made significant development in this time period. Only in the last 20 years this technology and advanced methods have been available to us.

Methods of data collection for primary and secondary Data:

Primary Data: Primary data are original observations collected by the researcher or his agent for the first time for any investigation and used by them in the statistical analysis **Secondary Data**: Secondary data are collected by others and used by others.

The data which are primary at one time may be secondary at another. The difference between the primary and secondary data is only of the degree of detachment with the original source. Primary data are collected afresh and for first time while secondary data are already collected. Once the primary data have been used it loses its original character and becomes secondary. Such secondary data are mostly published in newspapers, periodicals and journals.

Methods of data collection of Primary data:

Direct personal investigation: This is a method in which the investigation is done personally for the required data .
Interview/questionnaires: under this method the investigator collects the data from the respondents putting questions to them regarding required data
Discussion with community leaders: Some data which are required cannot be collect through personal investigation or through interview so community leaders are approached to fetch information for the required data.

Choice between primary and secondary data:
The choice between primary and secondary data mainly depends upon the nature, objectives and scope of inquiry, availability of time and money, degree of accuracy desired and the status of the investigator. The primary data are more reliable on the face but the secondary data are are relied only by examining the source from which they have been obtained their true significance, completeness and method of collection. Sometimes in certain investigation both primary and secondary data are used as supplements to one another. It may be pointed out that today on a large number of statistical inquiries secondary data are generally used because fairly reliable published data on a large number of diverse fields now available. In fact primary data are collected only if there do not exist any secondary data suited to the investigation under study.

Data processing methods

1. Manual Data Processing

In ***manual data processing***, data is processed manually without using any machine or tool to get required results. In manual data processing, all the calculations and logical operations are performed manually on the data. Similarly, data is transferred manually from one place to another. This method of data processing is very slow and errors may occur in the output. Mostly, is processed manually in many small business firms as well as government offices & institutions. In an educational institute, for example, marks sheets, fee receipts, and other financial calculations (or transactions) are performed by hand. This method is avoided as far as possible because of the very high probability of error, labor intensive and very time consuming. This type of data processing forms the very primitive stage when technology was not available or it was not affordable. With the advancement in technology the dependency on manual methods has drastically decreased.

2. Mechanical Data Processing

In ***mechanical data processing*** method, data is processed by using different devices like typewriters, mechanical printers or other mechanical devices. This method of data processing is faster and more accurate than manual data processing. These are faster than the manual mode but still forms the early stages of data processing. With invention and evolution of more complex machines with better computing power this type of processing also started fading away. Examination boards and printing press use mechanical data processing devices frequently.

3. Electronic Data Processing

Electronic data processing or EDP is the modern technique to process data. The data is processed through computer; Data and set of instructions are given to the computer as input and the computer automatically processes the data according to the given set of instructions. The computer is also known as electronic data processing machine.

This method of processing data is very fast and accurate. For example, in a computerized education environment results of students are prepared through computer; in banks, accounts of customers are maintained (or processed) through computers etc.

Methods of Data Processing by electronic means

1. **Batch Processing:** Batch Processing is a method where the information to be organized is sorted into groups to allow for efficient and sequential processing. Online Processing is a method that utilizes Internet connections and equipment directly attached to a computer. It is used mainly for information recording and research. Real-Time Processing is a technique that has the ability to respond almost immediately to various signals in order to acquire and process information. Distributed Processing is commonly utilized by remote workstations connected to one big central workstation or server. ATMs are good examples of this data processing method.

2. Online Processing: This is a method that utilizes Internet connections and equipment directly attached to a computer. This allows for the data stored in one place and being used at altogether different place. Cloud computing can be considered as a example which uses this type of processing. It is used mainly for information recording and research.

3. Real-Time Processing: This technique has the ability to respond almost immediately to various signals in order to acquire and process information. These involve high maintenance and upfront cost attributed to very advanced technology and computing power. Time saved is maximum in this case as the output is seen in real time. For example in banking transactions

4. Distributed Processing: This method is commonly utilized by remote workstations connected to one big central workstation or server. ATMs are good examples of this data processing method. All the end machines run on a fixed software located at a particular place and makes use of exactly same information and sets of instruction.

Types Of Data Processing modes

- **Batch processing**
  - Refers to processing of data or information by grouping it into groups or batches.
  - The batches handled in sequence of separate stages of processing e.g. validation, sorting, computing etc., at pre-defined frequencies. E.g. a weekly factory payroll is naturally processed weekly.
- **Online processing**
  - consist of terminals connected to a computer and
  - communication by lines that connect different department of the business/system to a computer
- **Interactive processing**
  - Online order processing
  - Online building society transactions
  - Online payroll processing
  - Online point of sale (supermarket) check out systems
- **Real-time processing**
  - Airline seat reservation system
  - Online warehouse stock control
  - Online hotel accommodation system
  - Online banking
- **Random processing**
  - Online credit enquiries
  - Online product availability enquiries
  - Online account enquiries
  - Online package holiday availability enquiries

Data processing system

A **data processing system** is a combination of machines, people, and processes that for a set of inputs produces a defined set of outputs. The inputs and outputs are interpreted as data, facts, information,... depending on the interpreter's relation to the system.

A data processing system may involve some combination of:

- Conversion converting data to another format.
- Validation – Ensuring that supplied data is "clean, correct and useful."
- Sorting – "arranging items in some sequence and/or in different sets."
- Summarization – reducing detail data to its main points.
- Aggregation – combining multiple pieces of data.
- Analysis – the "collection, organization, analysis, interpretation and presentation of data.".
- Reporting – list detail or summary data or computed information.

Types of data processing systems

By application area

Scientific data processing

Scientific data processing "usually involves a great deal of computation (arithmetic and comparison operations) upon a relatively small amount of input data, resulting in a small volume of output."

Commercial data processing

Commercial data processing "involves a large volume of input data, relatively few computational operations, and a large volume of output." Accounting programs are the prototypical examples of data processing applications. Information systems (IS) is the field that studies such organizational computer systems.

Data analysis

"Data analysis is a body of methods that help to describe facts, detect patterns, develop explanations, and test hypotheses." For example, data analysis might be used to look at sales and customer data to "identify connections between products to allow for cross selling campaigns."

By service type

- Transaction processing systems
- Information storage and retrieval systems
- Command and control systems
- Computing service systems
- Process control systems
- Message switching systems

Hierarchy of Data

Data are the principal resources of an organization. Data stored in computer systems form a hierarchy extending from a single bit to a database, the major record-keeping entity of a firm. Each higher rung of this hierarchy is organized from the components below it.

Data are logically organized into:

1. Bits (characters)

2. Fields

3. Records

4. Files

5. Databases

Bit (Character) - a bit is the smallest unit of data representation (value of a bit may be a 0 or 1). Eight bits make a byte which can represent a character or a special symbol in a character code.

Field - a field consists of a grouping of characters. A data field represents an attribute (a characteristic or quality) of some entity (object, person, place, or event).

Record - a record represents a collection of attributes that describe a real-world entity. A record consists of fields, with each field describing an attribute of the entity.

File - a group of related records. Files are frequently classified by the application for which they are primarily used (employee file). A ***primary key*** in a file is the field (or fields) whose value identifies a record among others in a data file.

TOPIC 6

INFORMATION SYSTEMS IN AN ORGANIZATION

Definition of an organization

An organized body of people with a particular purpose, especially a business, society, association, etc.

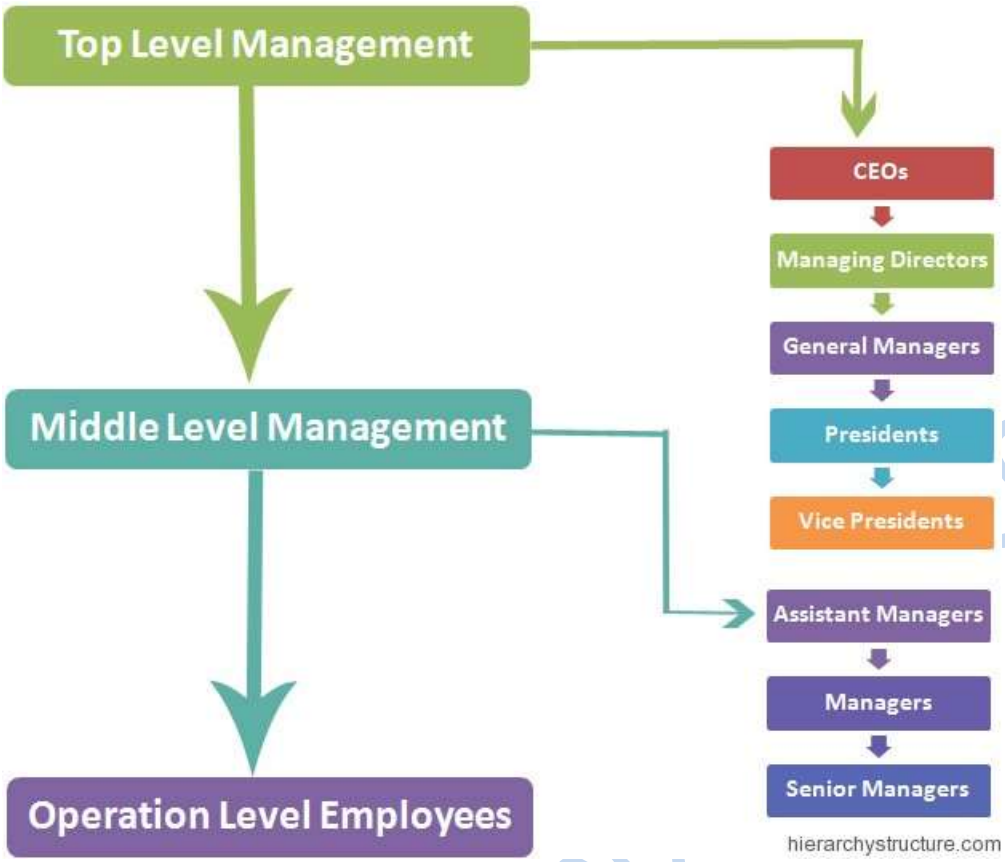
A social unit of people that is structured and managed to meet a need or to pursue collective goals.

Levels in Business organization Hierarchy

The levels in business hierarchy refer to the levels of chain of command, employee designations and designation categories which take a pyramidal form with the largest segment of employees situated at the base of the pyramid.

These employees who constitute the base of the pyramid are supervised by a relatively smaller group of supervisors or immediate managers who in return are supervised and managed by the officers placed above them in the hierarchy, and this way these levels in business hierarchy continue till they reach the highest level comprised by the CEO or the board of directors. Hence it can be concluded that the levels in any business hierarchy are the predefined steps represented by designations and which keep on narrowing from bottom to top.

These hierarchies are quite useful in developing an understanding of the roles of various employees in the organization. The following are the major levels in business hierarchy ranging from top to bottom.



Levels in Business Hierarchy

- Top Level Management
- Middle Level Management
- Operation Level Employees

Top Level Management

The top level management consists of people like CEOs, Managing Directors, General Managers, Presidents, and Vice Presidents etc. These are the personnel who are involved in the planning of the business as well as overseeing its performance. They deal with totality of business system and overlook both business & administration activities from top levels.

These are majorly engaged in scanning external and internal environments. These professionals are meant to make business a success in the long term perspective. Hence they need great conceptual decision making, reasoning and extra ordinary skills. These personnel are required to navigate the business activities all the time and take right decisions for the success of the business.

Middle Level Management

The second level in business hierarchy is middle management level. At this level are the managerial professionals like assistant managers, managers, senior managers etc. These

professionals are required to manage the activities pertaining to the actual usage of all the resources and leading the employees in the right direction. These are responsible for planning activities in order to achieve the organizational objectives framed by the top management.

These professionals are also required to achieve the operational and financial objectives on yearly basis. Their major focus is on striving profitability, liquidity, efficiency and effectiveness. The jobs performed by these professionals are knowledge & leadership oriented jobs.