# Data Processing and Networking

# BBA 510113: Computer and Information Technology

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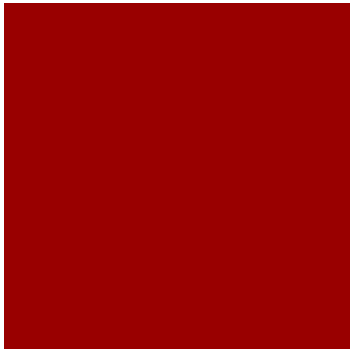
# Data Processing

Collection, manipulation, and processing collected data for the required use is known as data processing. It is a technique normally performed by a computer; the process includes retrieving, transforming, or classification of information.

# Data Processing

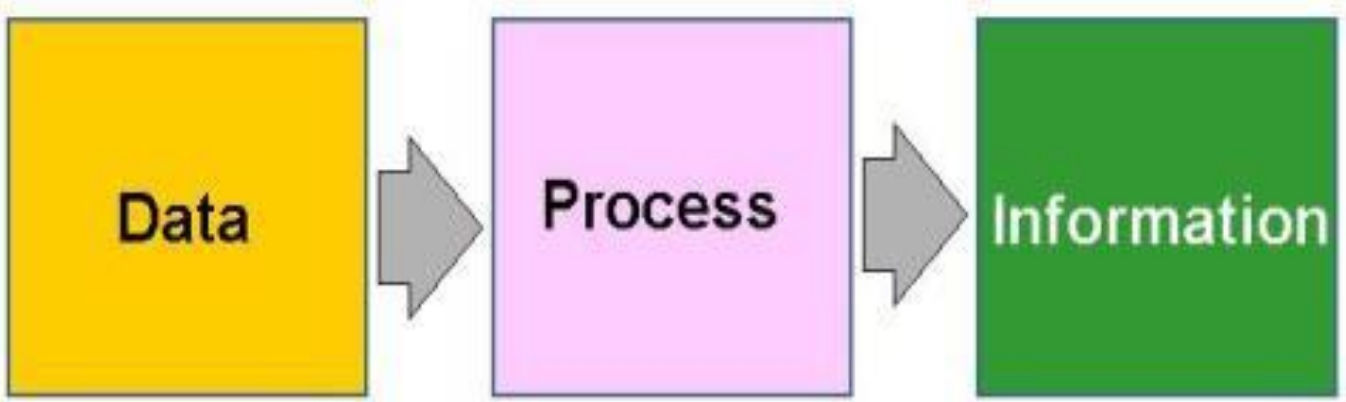


However, the processing of data largely depends on the following −

- The volume of data that need to be processed
- The complexity of data processing operations
- Capacity and inbuilt technology of respective computer system
- Technical skills
- Time constraints

# Data Processing

Data processing is a process of converting raw facts or data into a meaningful information.

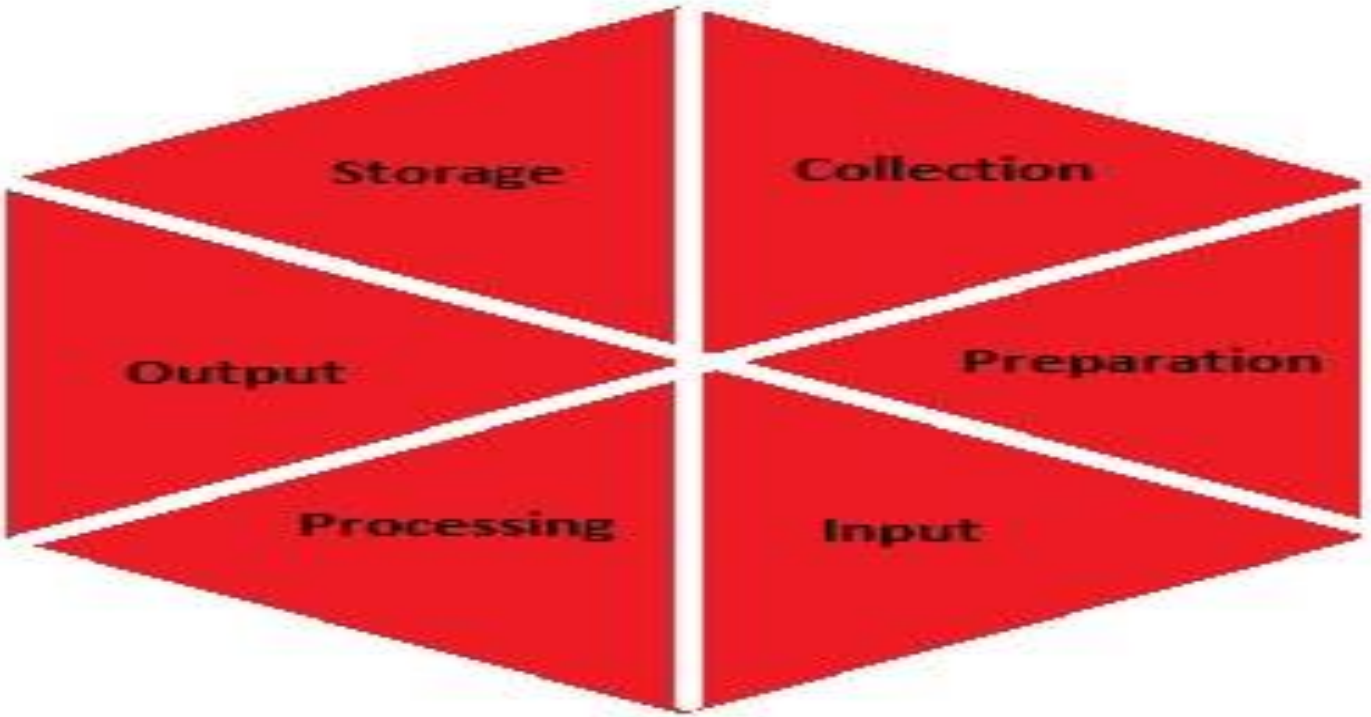


# Data Processing Cycle

The Data Processing Cycle is a series of steps carried out to extract useful information from raw data. Although each step must be taken in order, the order is cyclic. The output and storage stage can lead to the repeat of the data collection stage, resulting in another cycle of data processing. The cycle provides a view on how the data travels and transforms from collection to interpretation, and ultimately, used in effective business decisions.

# Data Processing Stages

Data processing consists of following 6 stages −



# Stages of Data Processing

- Collection: Collection of data refers to gathering of data. The data gathered should be defined and accurate.

- Preparation: Preparation is a process of constructing a dataset of data from different sources for future use in processing step of cycle.

- Input: Input refers to supply of data for processing. It can be fed into computer through any of input devices like keyboard, scanner, mouse, etc.

# Stages of Data Processing

- Processing: The process refers to concept of an actual execution of instructions. In this stage, raw facts or data is converted to meaningful information.
- Output and Interpretation: In this process, output will be displayed to user in form of text, audio, video, etc. Interpretation of output provides meaningful information to user.
- Storage: In this process, we can store data, instruction and information in permanent memory for future reference.

# Types of Data Processing

There are three types of data processing, they are—

- Manual Data Processing
- Mechanical Data Processing
- Electronic Data Processing

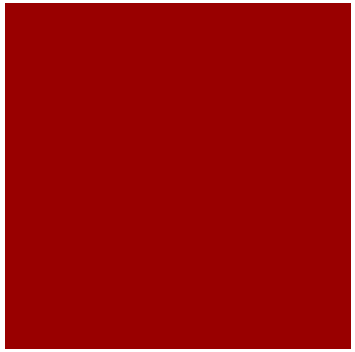
# Manual Data Processing

The data which is processed manually by human actions that are without using any tool is manual processing. Like for example manually writing or calculating a report manually and accurately is manual processing, manually verifying marks sheet, financial calculation, etc. The main disadvantage is that manual processing requires high labor costs, high time consumption, more errors, etc. Hence with this disadvantage, more advance tools have come where processing work is done automatically.

# Electronic Data Processing (EDP)

It is also called as information services or systems. It processes the raw data through computers and programs using electronic communication. The processing work is very fast. The best example for electronic data processing is an ATM card, which is embedded with an electronic chip.

# Real-Time Data Processing



It is a continuous process, which responds within seconds when the data input is given it gets processed and provides desired output data. For example, a person wants to draw a certain amount from his account using an ATM. As soon as he inserts the card and enters balance, he wants to draw along with ATM pin, the machine processes the transaction and updated his bank account balance online within a few seconds. The main advantage is time consumption.

# Methods of Data Processing

Let us now discuss the different methods of data processing.

- Single user programming
- Multiple programming
- Real-time processing
- On-line processing
- Time sharing processing
- Distributed processing

# Methods of Data Processing

- Single User Programming: It is usually done by a single person for his personal use. This technique is suitable even for small offices.

- Multiple Programming: This technique provides facility to store and execute more than one program in the Central Processing Unit (CPU) simultaneously. Further, the multiple programming technique increases the overall working efficiency of the respective computer.

# Methods of Data Processing

- Real-time Processing:  This technique facilitates the user to have direct contact with the computer system. This technique eases data processing. This technique is also known as the direct mode or the interactive mode technique and is developed exclusively to perform one task. It is a sort of online processing, which always remains under execution.

- On-line Processing: This technique facilitates the entry and execution of data directly; so, it does not store or accumulate first and then process. The technique is developed in such a way that reduces the data entry errors, as it validates data at various points and also ensures that only corrected data is entered. This technique is widely used for online applications.

# Methods of Data Processing

Time-sharing Processing

This is another form of online data processing that facilitates several users to share the resources of an online computer system. This technique is adopted when results are needed swiftly. Moreover, as the name suggests, this system is time based.

Following are some of the major advantages of time-sharing processing −

- Several users can be served simultaneously
- All the users have almost equal amount of processing time
- There is possibility of interaction with the running programs

# Methods of Data Processing

Distributed Processing

- This is a specialized data processing technique in which various computers (which are located remotely) remain interconnected with a single host computer making a network of computer.

- All these computer systems remain interconnected with a high speed communication network. This facilitates in the communication between computers. However, the central computer system maintains the master data base and monitors accordingly.

# OBJECTIVES OF DATA PROCESSING

- After the industrial revolution, the needs of the mankind increased. Man had to deal with large volume of data. He had to cope up with more and more information. The information collected is to be sorted out, stored and retrieved at short intervals. This necessitated the concept of data processing.
- As the complexities of business increased, the number of functions to be performed also increased. The data processing system must be responsible to supply the information when it is needed, so as to make the performance of the organization optimum.

# OBJECTIVES OF DATA PROCESSING

Let us have a look at the general objectives of Data Processing.

- Handle huge volume of Data: The basic objective of data processing is to handle huge data in order to enable the organization to function efficiently.
- Qualitative and quantitative information: The next important want of data processing is to provide qualitative and quantitative information.
- Proper and Timely Information: Different kinds of information are needed in almost all organizations. Data processing provides correct and timely information.

# OBJECTIVES OF DATA PROCESSING

- Storage and retrieval of data: Through data processing, information can be stored and retrieved as and when necessary.
- Helps in Decision-making: In every organization various decisions are taken at different levels. Such decisions can be more accurate if effective data processing system is used
- Improves Productivity: To improve productivity, various measures are to be identified and implemented. It is possible through the properly designed data processing system.

# OBJECTIVES OF DATA PROCESSING

- Maintaining Performance at Optimum Level: To maintain the performance of the organization at best possible level various functions at different levels of the organization are to be coordinated. There should be a smooth flow of information among various functional departments. This can be easily achieved through data processing system.
- Efficient Office Management: In office management also data processing plays a very important role, through which office automation can be done.

# PRACTICAL DATA PROCESSING APPLICATIONS IN BUSINESS

The following are some data processing information undertaken by commercial organizations.

- Process Control: In the production process, a computer is directly connected to some plant to control and monitor it. Here, the computer receives the data directly from the plant. It analyses the input data and initiates action to control the on-going process.
- Accounting: The Data Processing System can be used to maintain the accounting records and in preparation of final accounts. The general ledger, Accounts Payable, Accounts Receivable, etc. are the examples for the computerized accounting systems followed in most business organizations.

# PRACTICAL DATA PROCESSING APPLICATIONS IN BUSINESS

- Payroll preparation: In personnel department the data processing system is used to record the operations of the number of employees of different departments in each shifts, leave taken, deductions such as ESI, PF and finally in the preparation of Pay Slips.
- Sales Analysis: The Data Processing system is highly useful in sales analysis. The sales manager can prepare the sales forecast on the basis of per month's sales reports and subsequent future actions can be taken.
- Inventory Management: Actually the Data Processing System is a boon to every organization, in respect of inventory management. Data Processing is used to maintain up-to-date information about stock, their costs and to initiate orders when the times are about to be exhausted.

# PRACTICAL DATA PROCESSING APPLICATIONS IN BUSINESS

- Office Automation: The modem offices and business organizations are dependent upon computer based office automation for their competitiveness and better management.
- Banking and Insurance: Data Processing Systems are highly needed in the Banking sector where the customer satisfaction is the main criteria. To provide quick and perfect service, data processing system is used. Automatic Teller machines are places in big cities and linked to central computers. Hence, the delay in processing is completely avoided.

# PRACTICAL DATA PROCESSING APPLICATIONS IN BUSINESS

- Insurance and stock broking: Insurance companies and stock broking firms also use the computerized data processing systems. Large volume of data have to be processed for the preparation of policy statements, interest calculations, renewal notices and in dealing with the securities.
- Managerial aid: The Data Processing System is used as a managerial aid in decision-making for solving business problems. It is also very useful in the areas of linear programming, PERT, CPM etc. Today it appears that the computer is everywhere. Not only the business organization, the other institutions are also using data processing system for their regular use.

# Data Processing Operations

A data processing procedure normally consists of a number of basic processing operations performed in some order (not necessarily the order of their description below). The means of performing the processing operation vary according to whether manual, electro-mechanical, or electronic methods are used. Many business find that the best solution to their processing requirements is to use a combination of methods; e.g., manual may be used for small-volume jobs while computers may be used for large-volume tasks.

# Data Processing Operations

- Recording: Recording refers to the transfer of data onto some form of documents. It relates to the documentation of intermediate figures and facts and resulting from calculations. For example, in computing gross pay, the numbers of hours worked are multiplied by the hourly rate to arrive at gross pay.
- Verifying: Since recording is usually a manual operation, it is important that recorded data be carefully checked for any errors. This operation is called verifying. For example, punched card and type reports are reread for correctness.

# Data Processing Operations

- Duplicating: It is sometimes necessary or desirable to copy or duplicate data. This operation consists in reproducing data unto many forms or documents. For example, one may record by typing it, at the same time duplicating it using carbon paper. On the other hand, one may record a sales transaction by punching the data unto a card, and may then duplicate the card by using a duplicating machine.
- Classifying: This operation separates data into various categories. Identifying are arranging items with like characteristics into groups or classes is called classifying. For example, a person's social security number or student id number.

# Data Processing Operations

- Sorting: Arranging data in a specific order is called sorting. As an example, the names in a telephone book are sorted into alphabetical order, employee records may be sorted according to employee's last name or ID number.
- Calculating: Arithmetic manipulation of the data is known as calculating. In the calculation of an employee's pay, for example the total number of hours worked multiplied by the hourly wage rate would give the taxable gross earnings.
- Summarizing and Reporting: In this operation, a collection of data is condensed and certain conclusions from the data are represented in a meaningful format.

# Data Processing Operations

- Merging: As an example, sales reports from different store branches are merge to form an overall sales report for the whole business establishment.
- Storing: Placing similar data into files for future references is storing. Storage is done by any of the following methods: a) manual-such as in a ledger book, b) electromechanical-in the form of punched cards, and c) electronic-by magnetic tape, disk and main memory of the computer.
- Retrieving: Recovering stored data and/or information when needed is the retrieving step.
- Feedback: Feedback is the comparison of the output(s) and the goal set in advance.

# Data Processing Systems

Data processing systems are the combination of human, machine, and process. Human as people role are defined rules of process, gather data for the system and manage the system. Machine's role is operating the inputs according to rules defined by developers. The process has defined the way to handle inputs.

Steps of Data Processing Systems:

- Define requirements and Project Analysis
- Design
- Coding
- Test

# Computer Networking

- A computer networking is a process of connecting two more than two computers with the purpose to share data, provide technical support, and to communicate (especially for the business purpose.
- Internet is the technology that is used to connect different computer systems (located in different geographic location). Networking technology has revolutionized the world and created a new arena for the overall development of every nation.
- Advantages of Networking

  Let us now discuss the advantages of networking. The advantages are described below −

# Computer Networking

- Facility of Technical Support
- Easy Sharing of Data
- Easy Sharing of Hardware Resource
- Easy Sharing Software
- Easy to Decentralize Data Processing
- Easy to Communicate

**Types of Network**

- Local Area Network (LAN)
- Metropolitan Area Network (MAN)
- Wide Area Network (WAN)

# Computer Networking

- Local Area Network

  Local Area Network or simply LAN is the technique of interconnecting a few computers located in a given premise. It is normally used for a single business office or a residential apartment. The major purpose of such interconnectivity is to establish a communication system in order to make the work easier. However, in such connectivity, some other devices can also be attached such as laser printers, fax machine, etc.

- Metropolitan Area Network

  Metropolitan Area Network or simply MAN is a system of network that normally covers a large metropolitan area (city part).

# Computer Networking

It provides high speed Internet services throughout the area covered within the network.

- Wide Area Network

Wide Area Network or simply WAN is a system of network that covers a large geographical area across the world. The services of WAN are provided by public (government) agencies as well as private agencies. The network also provides the facility to access databases located remotely. The WAN system is highly beneficial for MNCs and other big corporate companies (offering online services).

# THANKS…