CHAPTER 1

INTRODUCTION TO MIS

Over View :

Management Information System (MIS) is a combination of principles, theories and practices of management, which play an important role in business organization in the planning and decision-making process.

It provides information for the personnel at various levels of management for performing their respective jobs.

The management information system can be compared with information technology (IT). IT can be considered as a sub-system of MIS.

MIS is defined as the field of management where timely and reliable information plays a very important role.

This information is obtained through a logical and well-structured method of collecting information and processing of the collected information, which helps the decision-makers in carrying out the decisions.

MIS is very significant these days because the term information is considered equally important to the three M have related to the business industry namely money, materials, men and machines.

To the managers, Management Information System is an implementation of the organizational systems and procedures. To a programmer it is nothing but file structures and file processing. However, it involves much more complexity.

The three components of MIS provide a more complete and focused definition, where **System** suggests integration and holistic view, **Information** stands for processed data, and **Management** is the ultimate user, the decision makers.

Management information system can thus be analysed as follows −

Management

Management covers the planning, control, and administration of the operations of a concern. The top management handles planning; the middle management concentrates on controlling; and the lower management is concerned with actual administration.

Information

Information, in MIS, means the processed data that helps the management in planning, controlling and operations. Data means all the facts arising out of the operations of the concern. Data is processed i.e. recorded, summarized, compared and finally presented to the management in the form of MIS report.

System

Data is processed into information with the help of a system. A system is made up of inputs, processing, output and feedback or control.

Thus MIS means a system for processing data in order to give proper information to the management for performing its functions.

Definition:

Management Information System **(MIS)** is a planned system of collecting, storing, and disseminating data in the form of information needed to carry out the functions of management

Management Information System **(MIS)** is a computer-based system that collectively provides managers with the information required to organize, manage and analyse the on-going project operations.

Characteristics of MIS

Following are the characteristics of an MIS −

- It should be based on a long-term planning.
- It should provide a holistic view of the dynamics and the structure of the organization.
- It should work as a complete and comprehensive system covering all interconnecting sub-systems within the organization.
- It should be planned in a top-down way, as the decision makers or the management should actively take part and provide clear direction at the development stage of the MIS.
- It should be based on need of strategic, operational and tactical information of managers of an organization.
- It should also take care of exceptional situations by reporting such situations.
- It should be able to make forecasts and estimates, and generate advanced information, thus providing a competitive advantage. Decision makers can take actions on the basis of such predictions.
- It should create linkage between all sub-systems within the organization, so that the decision makers can take the right decision based on an integrated view.
- It should allow easy flow of information through various sub-systems, thus avoiding redundancy and duplicity of data. It should simplify the operations with as much practicability as possible.
- Although the MIS is an integrated, complete system, it should be made in such a flexible way that it could be easily split into smaller sub-systems as and when required.
- A central database is the backbone of a well-built MIS.

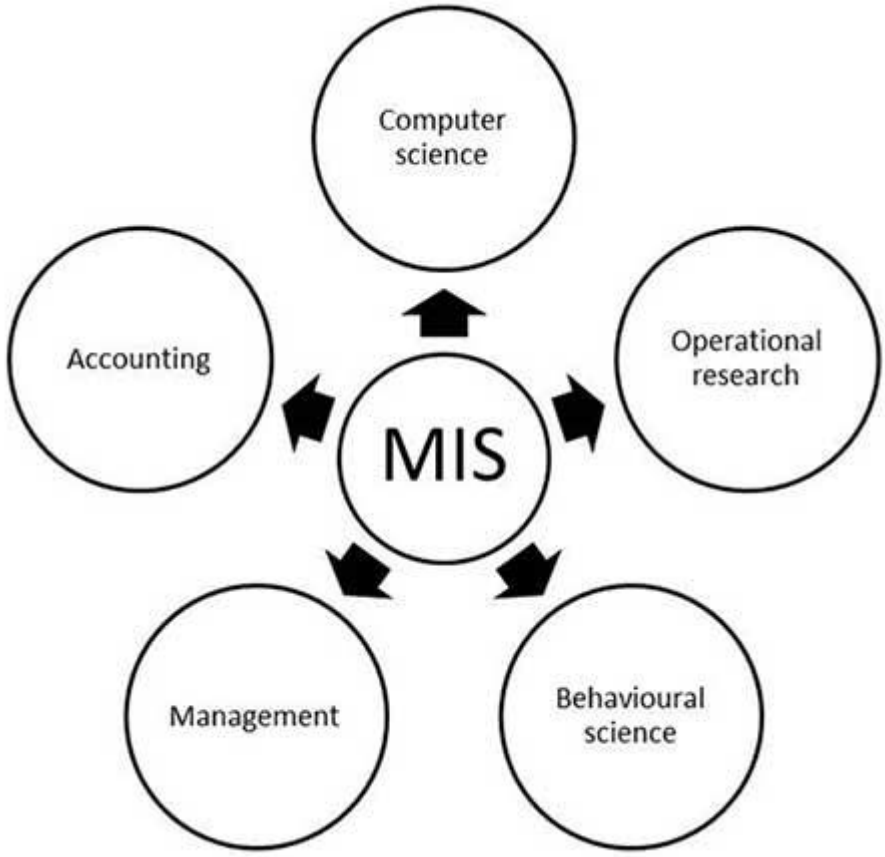
Characteristics of Computerized MIS

Following are the characteristics of a well-designed computerized MIS −

- It should be able to process data accurately and with high speed, using various techniques like operations research, simulation, heuristics, etc.
- It should be able to collect, organize, manipulate, and update large amount of raw data of both related and unrelated nature, coming from various internal and external sources at different periods of time.
- It should provide real time information on ongoing events without any delay.
- It should support various output formats and follow latest rules and regulations in practice.
- It should provide organized and relevant information for all levels of management: strategic, operational, and tactical.
- It should aim at extreme flexibility in data storage and retrieval.

Nature and Scope of MIS

The following diagram shows the nature and scope of MIS −



Components of MIS

The MIS has various components, which are as follows:

1. **Executives:**
   Executives are the people who utilize MIS. These people are computer professionals who operate MIS for data processing to achieve organizational goals like planning and decision-making.
2. **Hardware:**
   The hardware components of MIS include various input and output devices that helps in feeding data as well as displaying the information when required. The input devices include the keyboard, scanners and mouse. The output devices may be the monitor, printer, network devices, and so on.
3. **Software:**
   Computer programs which are designed to do a specific task for example, MS Office, Banking Software's, Railway's applications etc., different kinds of software available to process the data/information in an organization such as ERP (enterprise resource planning) and CRM (customer relationship management).
4. **Organizational Procedures:**

Procedures are sets of rules or guidelines that an organization establishes for the use of a computer-based information system. The procedures may vary from one organization to another. It may also vary from one department to another as per the requirement. For example, the working of production department is different from the working of sales department. The production department requires information regarding the raw material or quantity of goods to be produced. So, the production department sets its procedures in such a way that the MIS system helps in retrieving the information required by the department. In the similar way, the sales department requires information regarding the quantity of goods sold and the other expenses that occurred during the sales of the product. Therefore, the sales department sets the procedures in such a way that they get only that information which is required from the MIS.

Functions of MIS

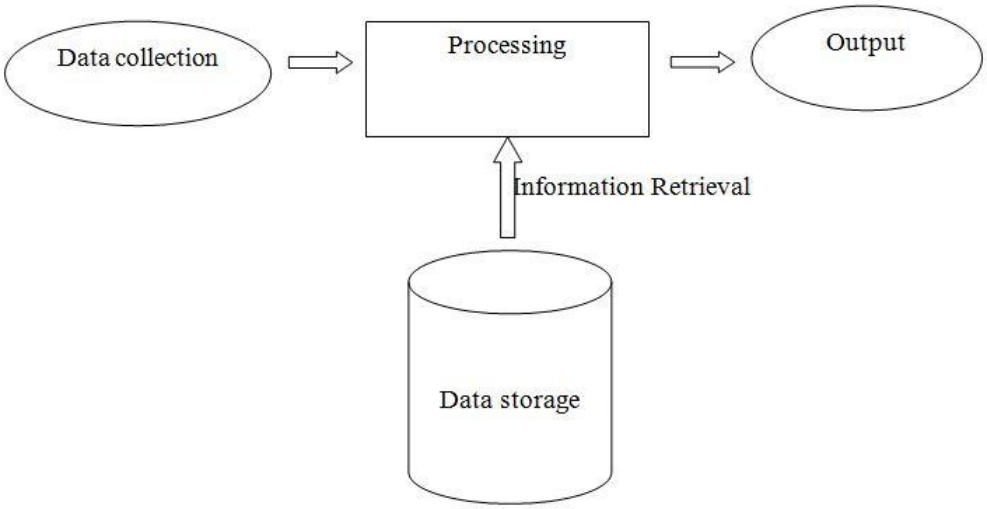
Functions of MIS

The main goal to set up an MIS in a company is to utilize the information by its managers for managerial purpose for decision making. MIS performs following functions to achieve organizational goal:

To collect useful data:

MIS executes the data through computer system using the sources of an organization. The organizational data is stores in computer system or as a paper record by its end users.

1. **Data Processing:** Processing data includes converting the storage data into the required information to take beneficial actions. Data processing includes mathematical and logical operations like, calculations, sorting, classifying and summarizing the data. The data processing signifies processing activities as:
    - Organize data
    - Analysis on data
    - Apply statistical, mathematical, operations
    - To create predictive modelling
    - Research and forecasting
2. **Information storage and retrieval:** MIS stores data as an organizational record and processed for future use. The data organizes as a fields, records, files and databases for future use. Information retrieval comprises to access the stored data as per the requirements of the management users.



3. **Disseminating management information:**
Information of finished product is categorizes and dispersed to the users in an organization as per the needs. This information could be periodic, through reports or online through computer terminals. Figure shows various functions perform.

Frame Work for Understanding MIS

1. Strategic Planning

This requires focusing on the objectives and goals of the organization, on changes in the objectives, on the resource requirements to fulfill the objectives and on the guiding principles and policies that will govern the acquisition, use and disposal of resources to attain the objectives. In short, this role is the most important role in the management hierarchy and the decisions taken by managers in this role have a far-reaching impact on the organization.

Managers in this role set the direction in which the organization will travel. In terms of hierarchy, this lies at the top.

2. Managerial Control

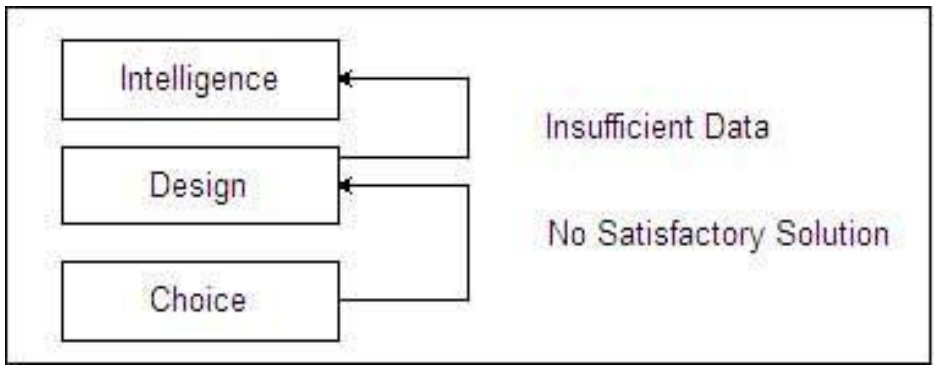
This requires that resources are acquired and used effectively and efficiently to attain the objectives of the organization. This is a middle management role. Managers in this role take guidance from the strategic planning hierarchy and control the activities of the organization such that the goals set by the higher level are attained in an efficient and effective manner. The impact of the decisions of the managers in this role is medium term and degree.

3. Operational Control

This requires that directives as set by the immediate higher hierarchy is followed and that specific task/s are carried out effectively and efficiently. The decisions at this level have very little impact on the organization. The organization behaves in a routine nature where the parameters of the decision-making process are well laid and certain.

Anthony's idea of an organization's hierarchy from the perspective of managerial activities. As is clear, it is a three-level pyramid with very distinct levels. Each level has its own set of tasks and decisions to take which have a varying impact on the organization as a whole.

Simon's Model of Decision Making.



1. Intelligence Phase

This is the first step towards the decision-making process. In this step the decision-maker identifies/detects the problem or opportunity.

A problem in the managerial context is detecting anything that is not according to the plan, rule or standard. An example of problem is the detection of sudden very high attrition for the present month by a HR manager among workers.

Opportunity seeking on the other hand is the identification of a promising circumstance that might lead to better results. An example of identification of opportunity is-a marketing manager gets to know that two of his competitors will shut down operations (demand being constant) for some reason in the next three months, this means that he will be able to sell more in the market.

Thus, we see that either in the case of a problem or for the purpose of opportunity seeking the decision-making process is initiated and the first stage is the clear understanding of the stimulus that triggers this process. So if a problem/opportunity triggers this process then the first stage deals with the complete understanding of the problem/opportunity. Intelligence phase of decision-making process involves:

Problem Searching: For searching the problem, the reality or actual is compared to some standards. Differences are measured & the differences are evaluated to determine whether there is any problem or not.

Problem Formulation: When the problem is identified, there is always a risk of solving the wrong problem. In problem formulation, establishing relations with some problem solved earlier or an analogy proves quite useful.

2. Design Phase

Design is the process of designing solution outlines for the problem. Alternative solutions are designed to solve the same problem. Each alternative solution is evaluated after gathering data about the solution. The evaluation is done on the basic of criteria to identify the positive and negative aspects of each solution. Quantitative tools and models are used to arrive at these solutions. At this stage the solutions are only outlines of actual solutions and are meant for analysis of their suitability alone. A lot of creativity and innovation is required to design solutions.

3. Choice Phase

It is the stage in which the possible solutions are compared against one another to find out the most suitable solution. The 'best' solution may be identified using quantitative tools like decision tree analysis or qualitative tools like the six thinking hats technique, force field analysis, etc.

This is not as easy as it sounds because each solution presents a scenario and the problem itself may have multiple objectives making the choice process a very difficult one. Also uncertainty about the outcomes and scenarios make the choice of a single solution difficult.

Information Requirement s And Levels of Management.

Levels of Management	Problems handled/ decisions made	Type of information required
1. Top level	Unstructured problems.	Strategic information from within the organization and outside.
2. Middle level	Decisions are based on situations not/rarely handled in the past. Decision-making variable not clearly defined. Semi structured/structured problems.	Information about likely scenarios. Information that can be analysed in different ways. Exception reports Regular summarized reports. Information that can be drilled deeper for insight.
3. Operational level	Decisions on regular issues. Decisions on tactical issues. Structured problems Structured decision-making Decision-making on the basis of set rules	Information to help find out exceptions so that they can be reported to top management Operational information Rule based information, guidelines, handbook level information

Structured VS Un-Structured decision :

- **Structured** decisions are the decisions which are made under the established situations for example hiring a new employee while
  unstructured decisions are made under the emergent situation, for example fire breakout.
- ✓ **Structured** decisions are the programmable decisions and they are pre planned for example the payroll for employees while
  unstructured decisions are creative and they are not pr eplanned for example if fire break there and then manager can make decision unplanned.
- **Structured** decisions are made in the situations which are fully understood while in **unstructured** decisions the situations are uncertain and unclear.

- **Structured** decisions are generally made for routine tasks, for instance the hiring of new IT specialists in a firm while
  unstructured decisions are made for a sudden one-shot kind of situations, for instance, dealing with a labour strike in a factory.
  - Structured decisions are made for specified processes like specialized manufacturing processes while

    unstructured decisions are made for general processes.

- **Structured decisions** have a well-defined methodology for finding a solution and have the data to reach a decisions. They are usually straight forward and made on a regular basis, an example of a structured decision in my company is whether or not to withdraw funds from an international account depending on the current exchange rate.

  Unstructured decision rely on knowledge and/or expertise and often require data and models to solve, an example of an unstructured decision in my company is what types of new content should be created and what market should be targeted.

Formal vs. Informal Decision

Formal Information system:

The formal information system is composed of:

- Information resources like Archives and Databases.
- The user of the information (It may be Internal, external or maybe the organization owned this)
- Information needs of the system. By this we mean, what type of data is required for which type of person, in any organization may be some data is required for the manager while another form of data will be required for an Engineer. Every role any organization has a different need for data.
- Communication Sub-systems.

The characterization of Formal system is done as:

- Perform different functions like Process identification, problem-solving, and diagnostics.
- Resources and other information needs of the users are organized that are required for the different fields in any organization.
- The formal Information system located at the organization structure of the company as Information Technology Division but it also works as a Distributed system.

Informal Information System.

As the word suggests, Informal means anything that happens that is not described by the formal structure. The following are some of the examples of such systems.

- Conversation
- Rumours about employees, customers or social media posts.
- Messages on Social media or Blogs.
- Conversation over coffee or launch.
- Exchange of news on unrelated topics during office hours.

MIS Systems Analysis and Design

Systems analysis and design refers to two closely related disciplines system analysis and system design.

The system development life cycle refers to the processing of planning, creating, testing, and deploying an information system. The main objective of system development life cycle is to produce high-quality information systems that meet or exceed the expectations of the users within the stipulated budget and time frame.

- **System analysis** is concerned with understanding the business objectives, goals and developing business processes. The end product of systems analysis is systems specifications.
- **System design** uses the output from system analysis as its input. The main objective of system design is to interpret the system requirements into architectural, logical and physical designs of how the information system to be implemented.