**UNIT -1**

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.

**CONCEPTS: The word 'MIS' comprises of three basic elements such as**:

**a) Management**

**b) Information**

**c) System**

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.

**Meaning of MIS:**

MIS is the use of information technology, people, and business processes to record, store and process data to produce information that decision makers can use to make day to day decisions.

MIS is the acronym for Management Information Systems. In a nutshell, MIS is a collection of systems, hardware, procedures and people that all work together to process, store, and produce information that is useful to the organization.

**Definition:**

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

The MIS has been understood and described in a number of ways. It is also referred to as:

a) Information system

b) Information and decision system

c) Computer based information system

**MIS can be defined in a number of ways:**

1. The MIS is defined as a system which provides information support for decision making in the organisation.

2. MIS is an integrated system of men and machines for providing the information to support the operations, the management and decision-making functions in the organisation.

3. MIS is defined as a system based on the database to the Organisation evolved for the purpose of providing information to the people in the Organisation.

**Objectives of MIS**

The goals of an MIS are to implement the organizational structure and dynamics of the enterprise for the purpose of managing the organization in a better way and capturing the potential of the information system for competitive advantage.

Following are the basic objectives of an MIS –

\* **Capturing Data** − Capturing contextual data, or operational information that will contribute in decision making from various internal and external sources of organization.

• **Processing Data** − The captured data is processed into information needed for planning, organizing, coordinating, directing and controlling functionalities at strategic, tactical and operational level. Processing data means:

* making calculations with the data
* sorting data
* classifying data and
* summarizing data

**\* Information Storage** − Information or processed data need to be stored for future use.

* Information Retrieval − The system should be able to retrieve this information from the storage as and when required by various users.
* Information Propagation − Information or the finished product of the MIS should be circulated to its users periodically using the organizational network.

**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 subsystems 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.

**SCOPE OF MIS:**

1. MIS is an integrated system for providing information to support:
   * The operations
   * Management
   * Decision-making functions in an organization
2. MIS utilizes computer hardware/ software, manual procedures, management and decision models and a data base.
3. MIS as a pyramid structure

* MIS for strategic policy planning & Decision making
* Management information for planning and Decision making
* Management information for operational planning Decision making and control.
* Transaction Processing Eg.:Status inquires payroll

**IMPORTANCE OF MIS:**

MIS is important in business because of the following reasons:

1) It helps in minimizing risk in decision-making

2) It processes the data and derives information out of them

3) It provides information about the various aspects of business

4) It helps the executives to avail the information regarding the functional areas quickly

5) It helps the HRD manager in finding out the requirement of the human resource, their wages and salary, performance appraisal, training, promotion, absenteeism and employees, turnover, which is useful in drafting sound HRD policies.

**FUNCTIONS OF MIS:**

* MIS is set up by an organization with the prime objective to obtain management information which is to be used by its managers in decision-making. Thus, MIS must perform the following functions in order to meet its objectives.
* Data Capturing: MIS captures data from various internal and external sources of an organization. Data capturing may be manual or through computer terminals. End users typically record data about transactions on some physical medium, such a paper form, or enter it directly into a computer system.
* Processing of Data: The captured data is processed are convert it into the required management information. Processing of data is done by such activities as calculating, comparing, sorting, classifying and summarizing. These activities organize, analyze and manipulate data using various statistical, mathematical, operations research and/ or other business models.
* Storage of Information: MIS stores processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organizational record. In this activity, data and information are retained in an organized manner for later use. Stored data is commonly organized into fields, records, files and databases, all of which will be discussed in detail in later chapter.
* Retrieval of information: MIS retrieves information from its stores as and when required by various users. As per the requirements of management users, the retrieved information is either disseminated as such or it is processed again to meet the exact MI demands.
* Dissemination of information: Information, which is a finished product of MIS, is disseminated to the users in the organization. It could be periodic through reports, or online through computer terminals.

**STRUCTURE OF MIS:**

Structure of MIS is a difficult concept to understand because there is no standard or universally accepted framework for describing management information system. MIS structure may be described by following a variety of different approaches, such as:

* + - Physical Components
    - Information system processing functions
    - Decision support
    - Levels of management activities and
    - Organizational functions

**Physical Components:**

Structure of MIS may be understood by looking at the physical components of the information system in an organization.

♣ Hardware

♣ Software

♣ Database

♣ Procedures

♣Operating personnel

♣ Input and Output

**Information system processing functions:**

Information system structure can also be understood in terms of its processing functions. The functions of an MIS explain what the system does. The main processing functions of information systems are described below.

ϖ To process transactions: Information systems process transactions. Where transaction may be defined as an activity taking place in an organization.

ϖ To maintain master file: Information systems create and maintain master files in an organization. A master file stores relatively permanent or historical data about organizational entities.

ϖ To produce report: Reports are significant products of an information system. Many reports are produced on a regular basis, which are called scheduled reports. An information system also produces reports on adhoc (special) requests.

ϖ To process enquires: An information system is used to process enquiries. For processing such queries, the information system uses its database. These may be regular enquiries with a pre defined format or adhoc enquiries.

ϖ To process interactive support application: The information system contains applications designed to support systems for planning, analysis and decision-making. Various types of models are used for processing.

**DECISION SUPPORT:**

Structure of MIS can also be described on the basis of its support in decision-making in an organization. Decisions vary with respect to the structure that can be provided for making them. A highly structured decision can be preplanned, whereas a highly unstructured decision cannot. However, it should not be taken to necessarily mean that the decision is automated, although many programmable decisions are automate.

**LEVELS OF MANAGEMENT ACTIVITIES:**

Management information systems support various management activities in an organization. This implies that the structure of an information system can be categorized in terms of levels of management activities. Anthony, on the basis of activities, has classified the management hierarchy into three levels. These are:

* Strategic Planning Level
* Management Control Level
* Operational Control Level

Strategic Planning deals with long-range considerations.

Management Control Level includes acquisition and organization of resources, structuring of work, and acquisition and training of personnel.

Operational Control is related to short-term decisions for current operations

**ORGANISATIONAL FUNCTIONS:**

Activities:

* Strategic planning
* Management control
* Operational control
* Transaction processing

Organizational Function:

* Production
* Finance
* Personnel
* MIS etc.

Concepts of Information System:

The concept of Information System has passed through several stages. In 1950, information was considered a necessary evil, whereas today information is regarded as an important strategic resource.

⎝ Information as a necessary evil

* + - Information for General Management Support
    - Information for Decision-making
    - Information as a strategic Resource

Information as a necessary evil:

Information was regarded as a necessary evil, associated with the development, production and marketing of products or services. Information was thus merely considered as a by-product of transactions in the organizations.

Information for General Management Support:

By mid 1960’s, organizations began recognizing information as an important tool which could support general management tasks.

Information for Decision-making:

In the early 1980’s information was regarded as providing special-purpose, tailor-made management controls over the organization. Decision Support System and Executive Support Systems were important advancements, which took place during this period.

Information as a strategic Resource:

In the revolutionary change pattern, the concept of information changed again by the mid-eighties and information has since then been considered as a strategic resource, capable of providing competitive advantage or a strategic weapon to fight the competition.

**Information system for decision making :**

**Decision :**

A choice made between alternative course of action in situation of uncertainty.

**Decision making :**

The thought process of selecting a logical choice from the available options. When trying to make a good decision, a person must weight the positives and negatives of each option, and consider all the alternatives. For effective decision making, a person must be able to forecast the outcome of each option as well, and based on all these items, determine which option is the best for that particular situations.

**Types of decisions :**

The following are the main types of decisions every organization need to take:

1. Programmed and non-programmed decisions:

Programmed decisions are concerned with the problems of repetitive nature or routine type matters.

A standard procedure is followed for tackling such problems. These decisions are taken generally by lower level managers. Decisions of this type may pertain to e.g. purchase of raw material, granting leave to an employee and supply of goods and implements to the employees, etc. Non-programmed decisions relate to difficult situations for which there is no easy solution.

These matters are very important for the organization. For example, opening of a new branch of the organization or a large number of employees absenting from the organization or introducing new product in the market, etc., are the decisions which are normally taken at the higher level.

#### 2. Routine and strategic decisions:

Routine decisions are related to the general functioning of the organization. They do not require much evaluation and analysis and can be taken quickly. Ample powers are delegated to lower ranks to take these decisions within the broad policy structure of the organization.

Strategic decisions are important which affect objectives, organizational goals and other important policy matters. These decisions usually involve huge investments or funds. These are non-repetitive in nature and are taken after careful analysis and evaluation of many alternatives. These decisions are taken at the higher level of management.

#### 3. Tactical (Policy) and operational decisions:

Decisions pertaining to various policy matters of the organization are policy decisions. These are taken by the top management and have long term impact on the functioning of the concern. For example, decisions regarding location of plant, volume of production and channels of distribution (Tactical) policies, etc. are policy decisions. Operating decisions relate to day-to-day functioning or operations of business. Middle and lower level managers take these decisions.

An example may be taken to distinguish these decisions. Decisions concerning payment of bonus to employees are a policy decision. On the other hand if bonus is to be given to the employees, calculation of bonus in respect of each employee is an operating decision.

#### 4. Organizational and personal decisions:

When an individual takes decision as an executive in the official capacity, it is known as organizational decision. If decision is taken by the executive in the personal capacity (thereby affecting his personal life), it is known as personal decision.

Sometimes these decisions may affect functioning of the organization also. For example, if an executive leaves the organization, it may affect the organization. The authority of taking organizational decisions may be delegated, whereas personal decisions cannot be delegated.

#### 5. Major and minor decisions:

Another classification of decisions is major and minor. Decision pertaining to purchase of new factory premises is a major decision. Major decisions are taken by top management. Purchase of office stationery is a minor decision which can be taken by office superintendent.

#### 6. Individual and group decisions:

When the decision is taken by a single individual, it is known as individual decision. Usually routine type decisions are taken by individuals within the broad policy framework of the organization.

Group decisions are taken by group of individuals constituted in the form of a standing committee. Generally very important and pertinent matters for the organization are referred to this committee. The main aim in taking group decisions is the involvement of maximum number of individuals in the process of decision­- making.

**Decision making process :**

In general, the decision making process helps managers and other business professionals solve problems by examining alternative choices and deciding on the best route to take. Using a step-by-step approach is an efficient way to make thoughtful, informed decisions that have a positive impact on your organization’s short- and long-term goals.

The business decision making process is commonly divided into seven steps. Managers may utilize many of these steps without realizing it, but gaining a clearer understanding of best practices can improve the effectiveness of your decisions.

**Steps of the Decision Making Process:**

The following are the seven key steps of the decision making process.

* 1. Identify the decision –

 The first step in making the right decision is recognizing the problem or opportunity and deciding to address it. Determine why this decision will make a difference to your customers or fellow employees.

* 1. Gather information-

Next, it’s time to gather information so make a decision based on facts and data. This requires making a value judgment, determining what information is relevant to the decision at hand. Then analyze what need to know in order to make the right decision, then actively seek out anyone who needs to be involved.

“[Managers seek out a range of information to clarify their options](http://smallbusiness.chron.com/steps-decisionmaking-process-manager-10601.html) once they have identified an issue that requires a decision. Managers may seek to determine potential causes of a problem, the people and processes involved in the issue and any constraints placed on the decision-making process.

* 1. **Identify alternatives –**

Once you have a clear understanding of the issue, it’s time to identify the various solutions at your disposal. It’s likely that you have many different options when it comes to making the decision, so it is important to come up with a range of options. This helps you determine which course of action is the best way to achieve objective.

* 1. **Weigh the evidence.  –**

In this step, need to “[evaluate for feasibility, acceptability and desirability](http://the-happy-manager.com/tips/steps-in-decision-making/)” to know which alternative is best. Managers need to be able to weigh pros and cons, then select the option that has the highest chances of success. It may be helpful to seek out a trusted second opinion to gain a new perspective on the issue at hand.

* 1. **Choose among alternatives –**

When it’s time to make decision, make sure on understanding the risks involved with chosen route. Combination of alternatives fully grasp all relevant information and potential risks.

* 1. **Take action –**

Next, we need to create a plan for implementation. This involves identifying what resources are required and gaining support from employees and stakeholders. Getting others onboard with decision is a key component of executing plan effectively, so be prepared to address any questions or concerns that may arise.

* 1. **Review your decision –**

An often-overlooked but important step in the decision making process is evaluating decision for effectiveness.“Even the most experienced business owners can learn from their mistakes … be ready to adapt the plan as necessary, or to switch to another potential solution” .

## Common Challenges of Decision Making:

Although following the steps outlined above will help make more effective decisions, there are some pitfalls to look out for. Here are common challenges you may face, along with best practices to help you avoid them.

* **Having too much or not enough information –**

Gathering relevant information is key when approaching the decision making process, but it’s important to identify how much background information is truly required. “[An overload of information can leave confused and misguided](http://www.corporatewellnessmagazine.com/focused/5-steps-to-good-decision-making/)”. In addition, relying on one single source of information can lead to bias and misinformation.

* **Misidentifying the problem –**

In many cases, the issues surrounding the decision will be obvious. However, there will be times when the decision is complex and aren’t sure where the main issue lies. Conduct thorough research and speak with internal experts who experience the problem firsthand in order to mitigate this. It will save you time and resources in the long run.

* **Overconfidence in the outcome –**

Even if the follow the steps of the decision making process, there is still a chance that the outcome won’t be exactly what you had in mind. That’s why it’s so important to identify a valid option that is plausible and achievable. Being overconfident in an unlikely outcome can lead to adverse results.

Decision making is a vital skill in the business workplace, particularly for managers and those in leadership positions. Following a logical procedure like the one outlined here, along with being aware of common challenges, can help ensure both thoughtful decision making and positive results.

**Role of system analyst :**

A **system analyst** is responsible for analyzing, designing and implementing systems to fulfill organizational needs. He/she plays a vital role in making operational the m The role of the analyst has however changed with time. Now a system analyst is seen more as a change agent responsible for delivering value to an organization on its investments in management information systems (that includes a heavy dose of information communication technology investment). A dictionary definition of a system analyst defines it as, 'a person who conducts a methodical study and evaluation of an activity such as business to identify its desired objectives in order to determine procedures by which these objectives can be gained.

An organization requires system analysts as line managers normally do not have an understanding of the kind of information-based solutions that are possible for their business problems. A system analysts bridges this gap as he/she is has a thorough knowledge of both the business systems and business processes. A system analyst is therefore in a position to provide information system based solutions to organizations after having studied the problem that the organization is facing. They understand both business and technology.

They study a business problem or opportunity and devise an information system enabled solution for it by detailing the information system specifications. This set of specification that the analyst delivers is in a technical format which is easily understandable to a technical (IT) specialist. The technical specialist might not understand the business issue, if it comes directly from the line managers as he has very little knowledge of business processes. The system analyst then bridges the gap between the two by translating and transforming the business problem/opportunity into a information systems solution and supplying the specification of such a system to the technologist who can then take up the task and build the actual system.

This may sound very easy but it is actually not an easy task. In most cases, the analyst works as a change agent. When devising a solution, the analyst does not restrict him/ her to the immediate problem/opportunity at hand but also focuses on the future. This requires that an analyst suggest some changes in the process of doing business to bring in greater efficiency in future. Inevitably, the process of creating an information systems enabled solution is coupled with the activity of business process reengineering through which change is brought in. The analyst uses the opportunity of devising a solution to bring in change and make the organization more efficient. Thus, a system analyst may also be considered as a change agent.

The *interpersonal skills required by a system analyst* are:

1. Communication:

The analyst needs to be a very good communicator to understand and communicate to the user group as well as to the1echnical specialists. Sometimes the users may not be able to communicate their needs fully to the analyst, but the analyst must be able to understand their needs from incomplete communication of the users.

1. Foresightedness and vision:

The analyst must have foresight and vision, so that they can factor in the future requirement of the users even if they have not factored that in the design. The analyst must also have vision with regard to the technological changes. He/she must be able to predict where the business needs and technological capabilities/constraints will be in the future. They should also clearly communicate that the design holds good not only for the short term but also the long term.

1. Adaptability and flexibility skills:

The analyst may be new to the environment of the particular business but he/she has to be quick on the uptake and adapt fast to the culture and environment of the organization. Some flexibility in the understanding of problems is also required along with the flexibility to come up with alternative solutions.

1. Selling:

The analyst needs to have flair to sell their ideas and solutions to the users. Sometimes this may be difficult as the users and clients might not know what solution will serve them best. The analyst needs to employ his selling skills to convince the users on the suitability of a solution.

1. Patience and rationality:

The analyst needs to be patient and rational so that he/she do not rush to a solution. If they make haste then they might miss critical information about the problem/opportunity and end up promoting a wrong solution for the users. Rationality is also a virtue for the system analyst, as this will help them in analyzing the problem/opportunity with a clear mind without prejudice.

1. Sound temperament:

The analyst needs to remain calm in the face of adverse situations. Most of the time the critical data that the analyst seeks is hard to come by and may be late in coming. The analyst will have to put up with all this and be clam in such situations. Thus, the temperament that he exhibits will help him in devising an appropriate solution for the client.

DATABASE MANAGEMENT SYSTEM (DBMS)

Database Management System (DBMS) is a software solution that allows you to create and maintain databases in which you can store the data. It basically refers to a system which helps store and retrieve the data systematically from a database. The different users such as database manager perform separate roles to manage the database in DBMS which supports multiple-layered architecture that provides physical and logical data independence. You can use DBMS to define a database that involves specifying the data types, structures and constants for the data to be stored in the database. DBMS also allows you to construct and manipulate a database. Constructing a database is a process of storing data on some storage medium such as floppy drive, compact disk (CD) or hard disk drive (HDD). Manipulating a database involves performing functions such as querying the database to retrieve specific data, updating the database to reflect changes made by the user and generating reports from the data. Following is the description of few basic terms of DBMS terminology:

• Database: A database is a collection of interrelated data. For example, you may have recorded the names, telephone numbers and addresses of the employees in an indexed addressed book or on a diskette using a personal computer and software such as MS ACCESS or MS EXCEL. This recorded information is a collection of related data with an implicit meaning and hence is a database.

• Defining a database: It involves specifying the data types, structures and constants for the data to be stored in the database.

• Constructing a database: It is a process of storing the real data on some storage medium with the help of a DBMS.

• Manipulating a database: It involves performing functions such as querying the database to retrieve specific data, updating the database to reflect changes made by the user and generating reports from the data.

• Database system: The database and DBMS software together is called a database system.

Features of DBMS

To understand the basics of database management systems, you must know the terms and definitions that are used in DBMS technology. These terms and definitions constitute DBMS terminology. DBMS is a software programme which may run on a user machine or a server computer. The DBMS accepts queries from users and responds to these queries. A DBMS has the following features:

• Structured data: DBMS enables you to structure the data as tables, records or objects.

• Query language: A DBMS provides a query language such as SQL to process the user requests. • Multi-user access: DBMS allows several users to access the data stored in a database. At the same time, it provides security features which restrict some users from viewing or manipulating the data. • Data dictionary: DBMS provides a data dictionary which contains the structure of a database.

• Data abstraction: It allows a Database Administrator (DBA) to logically separate the data from the programmes which use the data. There are three levels of abstraction in a database: external, conceptual and internal. The external level represents the user view of the database, conceptual level allows you to map internal and external levels, and the external level represents the operating system and DBMS level.

Functions Performed in DBMS

In DBMS, several people play important roles in organizing and manipulating the data. These roles are assigned to people according to the work performed by them in creating and maintaining the DBMS. The various roles performed in DBMS are as follows:

• Database administrator

• Database designers

• Database users

• Database manager

Benefits of DBMS

DBMS provides various advantages that make it useful for storing and maintaining the data. Following are the advantages of DBMS:

• Preventing data redundancy

• Restricting unauthorized access

• Persistent storage

• Multiple user interfaces

• Integrity constraints

• Backup and recovery of data