# Management Information System
# Unit-2

## An Overview of Management Information System

A management information system (MIS) is a computer system consisting of hardware and software that serves as the backbone of an organization's operations. An MIS gathers data from multiple online systems, analyzes the information, and reports data to aid in management decision-making. 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 a planned system of collecting, storing and disseminating data in the form of information needed to carry out the functions of management."**

The purpose of an MIS is improved decision-making, by providing up-to-date, accurate data on a variety of organizational assets, including:

- Financials
- Inventory
- Human Resources
- Project timelines
- Manufacturing
- Real estate
- Marketing
- Raw materials
- R&D

The MIS collects the data, stores it, and makes it accessible to managers who want to analyze the data by running reports.

**A Management Information System is**

- An integrated user-machine system
- For providing information
- To support the operations, management, analysis, and decision-making functions
- In an organization.

In a summarized way we can say that-

**"MIS is an organized integration of hardware and software technologies, data, processes and human elements. It is a software system that focuses on the management of information technology to provide efficient and effective strategic decision making".**

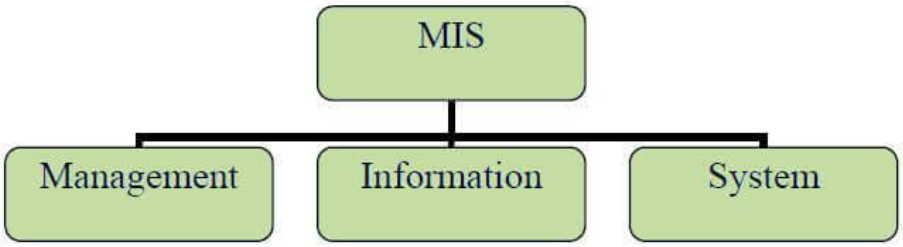
**The system utilizes**

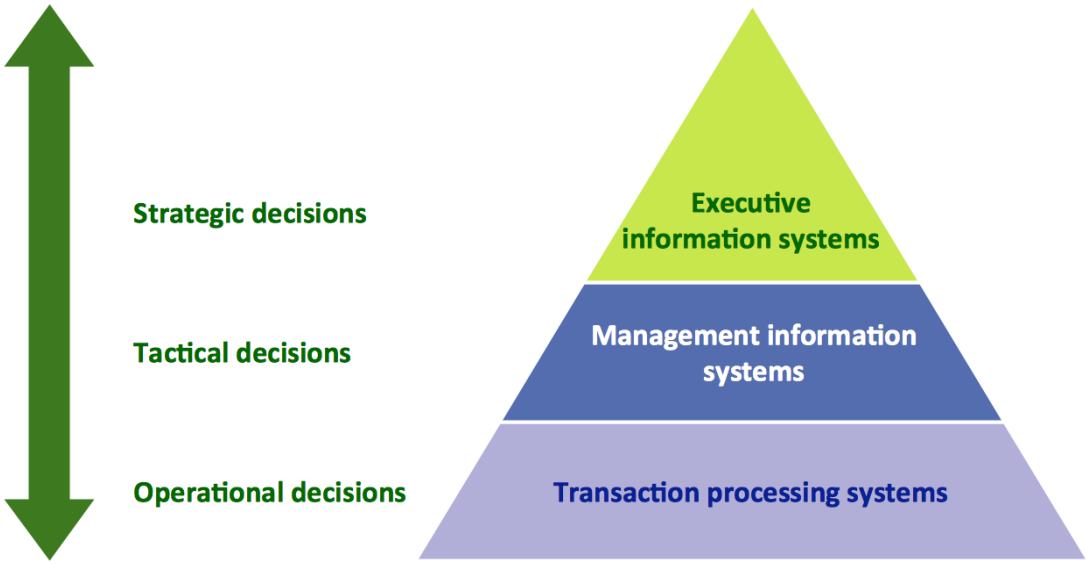
- Computer hardware & software
- Manual procedures

- Models for analysis, planning, control, and decision making, and
- A database

## MIS Meaning

**MIS Meaning**: A management information system is an short form of three words, viz., Management, information, system. In order to fully understand the term MIS, let us try to understand these three words.




1. **Management**: Management is the art of getting things done through and with the people in formally organized groups.
2. **Information**: Information is data that is processed and is presented in a form which assists decision-making. It may contain an element of surprise, reduce uncertainty or provoke a manager to initiate an action.
3. **System**: A system is an orderly grouping of interdependent components linked together according to a plan to achieve a specific goal. The term system is the most loosely held term in management literature because of its use in different contexts.

## Definition of MIS

The Management Information System (MIS) is a concept of the last decade or two. It has been understood and described in a number ways. It is also known as the Information System, the

Information and Decision System, the Computer- based information System. The MIS has more than one definition, some of which are give below.

1. The MIS is defined as a system which provides information support for decision making in the organization.
2. The MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision making function in the organization.
3. The MIS is defined as a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.
4. The MIS is defined as a Computer based Information System.

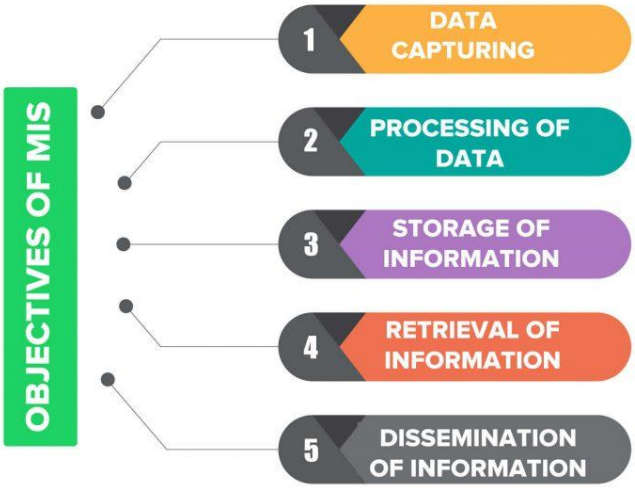
Thought there are a number of definitions, all of them converge on one single point, i.e., the MIS is a system to support the decision making function in the organization. The difference lies in defining the elements of the MIS. However, in today's world MIS a computerized .business processing system generating information for the people in the organization to meet the information needs decision making to achieve the corporate objective of the organization. In any organization, small or big, a major portion of the time goes in data collection, processing, documenting it to the people.

Hence, a major portion of the overheads goes into this kind of unproductive work in the organization. Every individual in an organization is continuously looking for some information which is needed to perform his/her task. Hence, the information is people-oriented and it varies with the nature of the people in the organization. The difficulty in handling this multiple requirement of the people is due to a couple of reasons. The information is a processed product to fulfill an imprecise need of the people. It takes time to search the data and may require a difficult processing path. It has a time value and unless processed on time and communicated, it has no value. The scope and the quantum of information is individual dependent and it is difficult to conceive the information as a well-defined product for the entire organization. Since the people are instrumental in any business transaction, a human error is possible in conducting the same. Since a human error is difficult to control, the difficulty arises in ensuring a hundred per cent quality assurance of information in terms of completeness, accuracy, validity, timeliness and meeting the decision making needs.

## Objectives of MIS

MIS has five major objectives which include:

1. **Data Capturing**
2. **Processing of Data**
3. **Storage of Information**
4. **Retrieval of Information**
5. **Dissemination of Information**



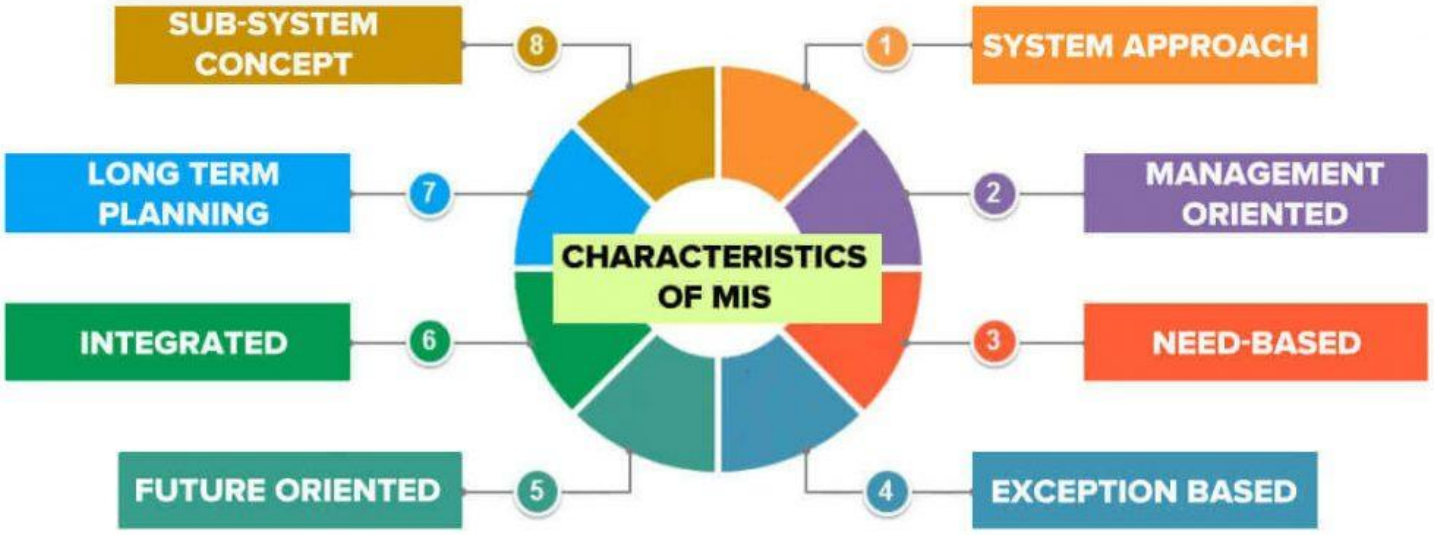

1. **Data Capturing:** MIS capture data from various internal and external sources of organization. Data capturing may be manual or through computer terminals.
2. **Processing of Data:** The captured data is processed to convert into required information. Processing of data is done by such activities as calculating, sorting, classifying, and Summarizing.
3. **Storage of Information**: MIS stores the processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organization record, for later use.
4. **Retrieval of Information:** MIS retrieves information from its stores as and when required by various users.
5. **Dissemination of Information:** Information, which is a finished product of MIS, is disseminated to the users in the organization. It is periodic or online through computer terminal.

## Characteristics of MIS:

**1. Systems Approach:** MIS follows the system approach, which implies a step by step approach to the study of system and its performance in the light of the objective for which it has been constituted. It means taking an inclusive view at sub-systems to operate within an organization.

**2. Management Oriented**: The management-oriented characteristic of MIS implies that top-down approach needs to be followed for designing MIS. A top-down method says the initiation of system development determines management requirements as well as business goals. MIS implies the management dynamically to the system development towards the completion of management decision.

**3. Need Based:** The design and development of MIS should be as per the information required by the managers. The required design and development information is at different levels, viz., strategic planning, management control and operational control. It means MIS should cater to the specific needs of managers in the hierarchy of an organization.




**4. Exception Based:** MIS should be developed on the exception based also, which means that in an abnormal situation, there should be immediate reporting about the exceptional situation to the decision –makers at the required level.

**5. Future Oriented:** The design and development of MIS should also be future purpose so that the system is not restricted to provide only the past information.

**6. Integrated:** A complete MIS is a combination of its multiple sub-components to provide the relevant information to take out a useful decision. An integrated system, which blends information from several operational areas, is a necessary characteristic of MIS.

**7. Long Term Planning:** MIS should always develop as a long term planning because it involves logical planning to get success of an organization. While developing MIS, the analyst should keep future oriented analysis and needs of the company in mind.

**8**. **Sub System Concept:** The MIS should be viewed as a single entity, but it must be broken down into digestible sub-systems which are more meaningful.

Besides all these characteristics of MIS, one more important characteristic that should be in every MIS is Central Database:

**9. Central database:** In the MIS there should be common data base for whole system. It contains data in tabular form. The data base is responsible to operations like insertion, deletion, and updation of records. This database covers information related to inventory, human resources, vendors, customers, etc. the data stored in the database.

## Advantages of Management Information System:

- **Helps to achieve a higher level of efficiency:**

The managers who manage their team or the whole organization they usually have to identify organizations' strengths and weaknesses.

- **Improves the quality of decisions:**

Managers could make more rational decisions based on raw and reliable information based on the data they have.

- **Promotes better communications between departments in an organization:**

When everyone in the company shares the same information, then the scope is they have better communication between them due to which they can identify problem areas and they can sort it out.

- **Improves employee productivity:**

Employees save their productivity time as they don't have to gather the data asked by management

- **Strengthens a company's competitive advantage:**

By removing all weaknesses and non-performing areas boosts the company's competitiveness over its rivals.

- **Reveals more data about customers:**

The more the data about the requirements about the customers, management is better able to improve customer service and can think more effective marketing and promotional campaigns.

## Disadvantages of Management Information System:

- Highly sensitive data or information requires constant monitoring.
- Budgeting of MIS extremely difficult.
- Quality of outputs governed by the quality of inputs.
- Lack of flexibility to update it.
- Effectiveness decreases if there are any frequent changes in top management.
- On account only qualitative factors and ignores non-qualitative factors like morale of the employee, the attitude of the employee, etc.
- Unemployment and lack of job security.

## Challenges of MIS

There are three major challenges of MIS:

### High Cost

Development of new computerized based information system is a problem for the organization due to the cost factor and it creates problems because with the change of time there is need of up-to-date of the information system.

### Training of Employee

Employees should have the capacity of learning of the information system with the changing competitive and business environment; otherwise it will be difficult for the organization to stay in the market.

### Maintenance Cost

Sometimes a problem arises due to server crash and website crash. Sometimes it leads to the loss of information. So, maintenance cost is needed to tackle the above problem.

## MIS versus Data Processing

**Management Information System (MIS):**

MIS is an application of **computer related technology to programs**. It provides managers with information and support for effective decision-making and provides the feedback on daily operations. The outputs or reports are usually generated through accumulation of transaction processing data.

It ensures that appropriate data is collected from the valid sources, processed and passed to needy destinations. It satisfies the needs through **query systems, analysis systems**, **modeling systems.**

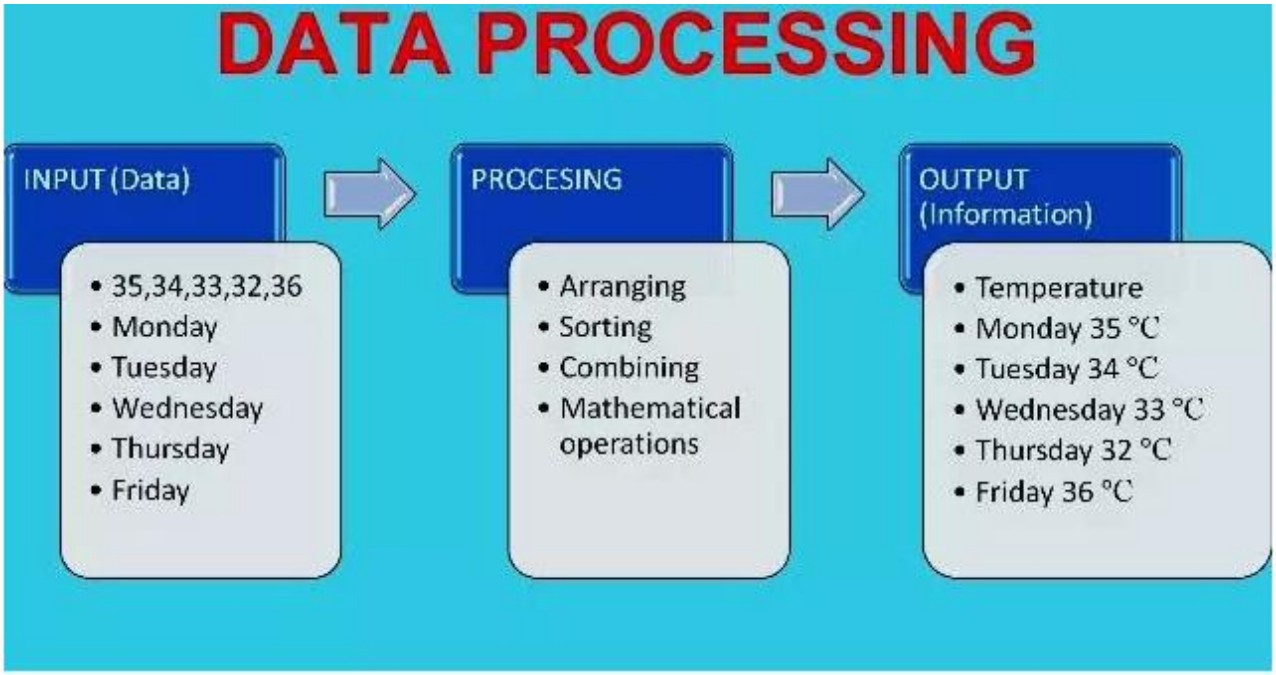
The main functioning of MIS are as:

- It supports **data processing** functions.
- It uses an **integrated database** and **supports a variety of functional areas.**
- It provides **operational** and **strategic** levels of organization.
- It is **flexible**.
- It can **adapt to the changing needs of the organization** which is a big advantage of MIS.

**Data Processing System (DPS):**

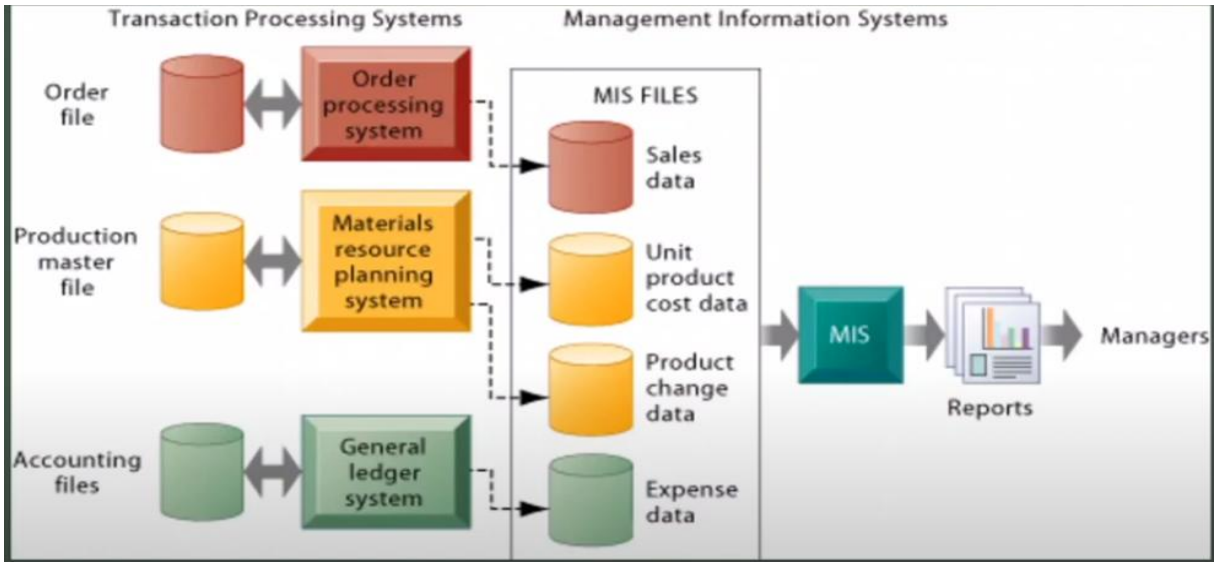
The **execution of a systematic sequence of operations performed upon data to transform it into information is known as data processing.** DPS is the **manipulation of data by computers**. It represents the automation of routines processing to support operations. Basically, it converts raw data into readable format which can be easily utilized by the people in the organization.

The data processing functions are data collection, manipulation, and storage as used to report and analyze business activities. It is oriented primarily to **processing transaction data for day-to-day transactions**.



There are six stages of data processing:

- Data Collection
- Data Preparation
- Data Input
- Processing
- Data Output
- Data Storage




**Difference between MIS and DPS:**

| MIS | DPS |
|---|---|
| It uses an integrated database. | It does not use integrated databases. |
| It provides greater flexibility to the management. | It provides no such flexibility. |
| It integrates the information flow between functional areas. | It tends to support a single functional area. |
| It focuses on information needs of all level of management. | It focuses on departmental level support. |
| Output is in the form of graph or chart. | Output is in the form of the table. |
| The model is simple. | Sometimes, the model becomes complex. |
| Focuses on operational functionality. | It focuses on converting data to another form (readable) or language. |

## An example of (Format) Data Processing System Output

| SALES | | | |
|---|---|---|---|
| purchase_number | date_of_purchase | customer_id | item_code |
| 1 | 03/09/2016 | 1 | A_1 |
| 2 | 02/12/2016 | 2 | C_1 |
| 3 | 15/04/2017 | 3 | D_1 |
| 4 | 24/05/2017 | 1 | B_2 |
| 5 | 25/05/2017 | 4 | B_2 |
| 6 | 06/06/2017 | 2 | B_1 |
| 7 | 10/06/2017 | 4 | A_2 |
| 8 | 13/06/2017 | 3 | C_1 |
| 9 | 20/07/2017 | 1 | A_1 |
| 10 | 11/08/2017 | 2 | B_1 |

## An example of (Format) MIS System Output

# MIS & Decision Support Systems

## MIS

MIS, Management Information System, is a computer based program to assist users to make decisions based on information present in the system. Managers at all levels require information to be provided to them to enable to carry out their functions effectively. This need is satisfied by means of a management information system.

A Management Information System (MIS) is a system that gathers comprehensive data, organizes and summarizes it in a form that is of value to functional managers, and provides them with information they need to carry out their work.

MIS is used to transform data into useful information in order to support managerial decision-making with structured decisions or programmed decisions. In simple words, a MIS is a computer-based information system which assists managers in decision-making and control and in planning more effectively.

## DSS

DSS, Decision Support System, is also to help making decisions. It uses communication technologies, data, and documents to identify problems and to finalize decisions.

A decision support system (DSS) is an interactive computer system that can be easily accessed and operated by people who **are not computer specialists**. It helps them to plan and **make decisions**. In other words, DSS is a computer-based information system that supports the process of managerial decision-making in situations that are not well structured.

Such systems do not actually provide "answers" or point to optimal decisions for managers. Rather, they attempt to improve the decision--making process by providing tools that help managers analyze the situations more clearly.

Thus DSS does not replace managerial decision-making but supports it and makes the process more effective. DSS has become increasingly popular because of **advances in computer software and hardware**.

**A typical DSS consists of the following elements:**

**i.** An **MIS** that supports several methodologies for accessing and summarizing data.

**ii.** A **special database** that allows information to be accessed in various ways.

**iii.** A **user-friendly interface** that allows the user to use simple commands rather than technical computer terms when communicating with the DSS.

A DSS must provide information to managers whenever it is needed in a form they can easily understand. A typical DSS places the information under the manager's direct control.

Following are the important differences between MIS and DSS.

| Sr. No. | Key | MIS | DSS |
|---|---|---|---|
| 1 | **Primary Task** | MIS identifies the information required. | DSS identifies the tools to be used in decision process. |
| 2 | **Focus** | Focus is on efficiency. | Focus is on effectiveness. |
| 3 | **Database** | Corporate Databases are used. | Special Database needed. |
| 4 | **Data** | Focus is on data storage. | Focus is on data manipulation. |
| 5 | **Dependency** | Dependent on computer. | Dependent on management authority. |
| 6 | **Usage** | MIS is used to in **control process**. | DSS is used in **planning, staffing and decision making**. |
| 7 | **Users** | MIS is used by middle level, low level users and senior executives in some cases. | DSS is used by **analysts**, **professionals** and **managers** so that they can take decisions. |
| 8 | **Focus** | Focus is on information processing. | Focus is on decision making, support and analysis. |

# MIS & Information Resources Management

Information Resources Management (IRM) is the process of **managing information resources** to **accomplish organization missions and to improve organization performance**, including the reduction of information collection burdens on the public. When standardized and controlled, these resources can be shared and re-used throughout an organization, not just by a single user or application.

**There are three (3) classes of information resources:**

- **Business Resources**: Enterprises, Business Functions, Positions (Jobs), Human/Machine Resources, Skills, Business Objectives, Projects, and Information Requirements.
- **System Resources:** Systems, Sub-Systems (business processes), Administrative Procedures (manual procedures and office automation related), Computer Procedures, Programs, Operational Steps, Modules, and Subroutines.
- **Data Resources:** Data Elements, Storage Records, Files (computer and manual), Views, Objects, Inputs, Outputs, Panels, Maps, Call Parameters, and Data Bases.

The concept of IRM is actually no different in intent than Materials Resource Planning (MRP) as used in manufacturing. Both are concerned with the **efficient and cost effective use of resources**. The classification and control of resources are the main objectives. Resources are classified to prove their uniqueness so that redundancy is not introduced and to promote sharing. Control is required to collect, inventory and retrieve resources as required by the business.

Whereas MRP is concerned with managing products and the parts required producing them, IRM is concerned with managing information and the resources required to produce it.

One of the important by-products of cataloging and cross-referencing information resources is a model of the enterprise, including how it is organized and how it operates. Other benefits include:

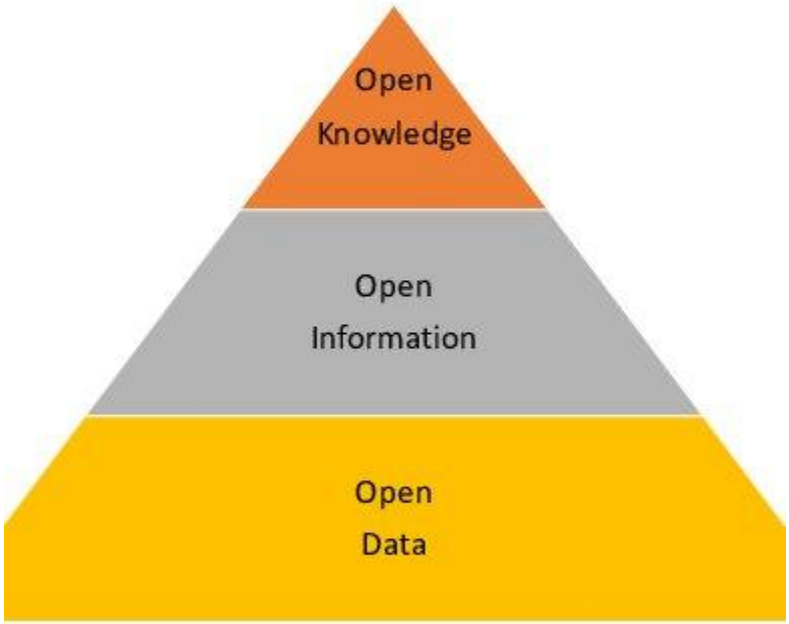
- All information resources are controllable, permitting the ability to design integrated systems and perform an “impact analysis” of a proposed resource change.
- Simplified search of information resources for reuse. Redundancy of resource definition is eliminated.
- Complete and current documentation of all information resources, in an organized and meaningful way.
- Communications within the organization is improved since developers and users would use standard and common definitions for information resources, all of which would be in standard business terminology.

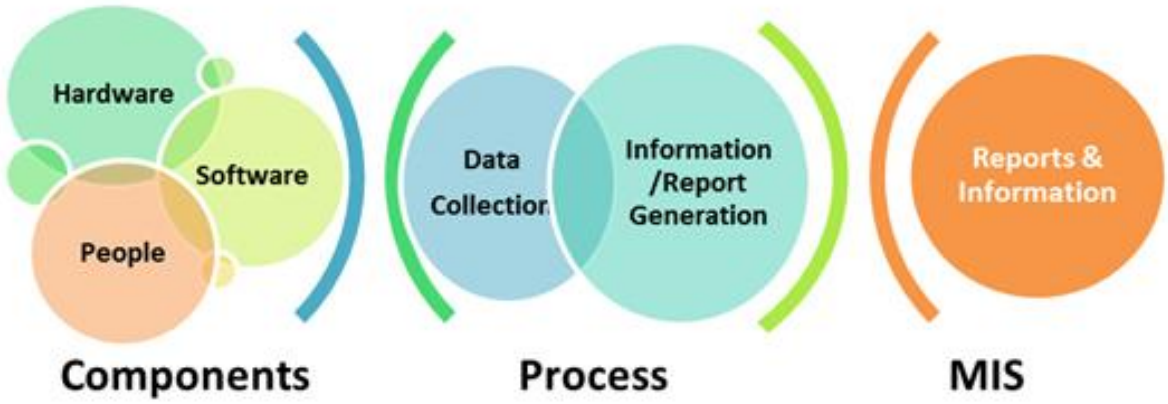
## Concept of MIS

The MIS is an idea which is associated with man, machine, marketing and methods for collecting information's from the internal and external source and processing this information for the purpose of facilitating the process of decision-making of the business.

MIS is not new, only the computerization is new , before computers MIS techniques existed to supply managers with the information that would permit them to plan and control business operations. The computer has added on more dimensions such as speed, accuracy and increased volume of data that permit the consideration of more alternatives in decision-making process.

Management information system is an integrated set of component or entities that interact to achieve a particular function, objective or goal. Therefore it is a computer based system that provides information for decisions making on planning, organizing and controlling the operation of the sub-system of the firm and provides a synergistic organization in the process.




The component of an information system includes: a hardware which is used for input/output process and storage of data, software used to process data and also to instruct the hand-ware component, data bases which is the location in the system where all the organization data will be automated and procedures which is a set of documents that explain the structure of that management information system.

There are various driving factors of management information system for example:-

Technological revolutions in all sectors make modern managers to need to have access to large amount of selective information for the complex tasks and decisions.

The lifespan of most product has continued getting shorter and shorter and therefore the challenge to the manager is to design product that will take a longer shelf life and in order to do this, the manager must be able to keep abreast of the factors that influences the organization product and services thus, management information system come in handy in supporting the process.

There are huge amount of information available to today's manager and this had therefore meant that managers are increasingly relying on management information system to access the exploding information. Management information services helps manager to access relevant, accurate, up-to-date information which is the more sure way of making accurate decisions. It also helps in automation and incorporation of research and management science techniques into the overall management information system for example probability theory.

The management information services are capable of taking advantage of the computational ability of the company like processing, storage capacity among others.

Based on this relevancy, management information system should be installed and upgraded in various organizations since today's managers need them to access information for managerial decision making and also management functions.

# Structure of Management information system

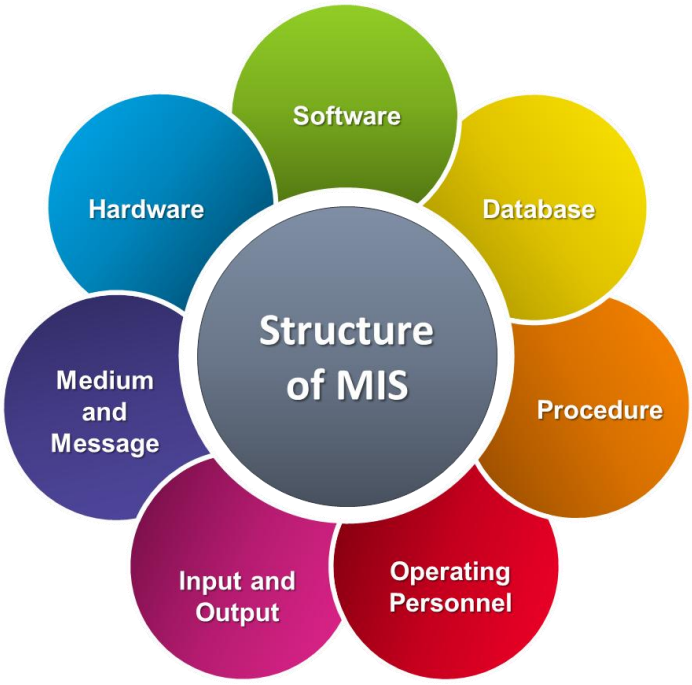
A management information system (MIS) is an organized combination of people, hardware, communication networks and data sources that collects, transforms and distributes information in an organization. An MIS helps decision making by providing timely, relevant and accurate information to managers. The physical components of an MIS include hardware, software, database, personnel and procedures.

**Hardware**

All physical components of a computer system compose the computer hardware. Important components include the central processing unit, input/output devices, storage units and communication devices. Communication can be over fiber-optic cables or wireless networks.

**Software**

Software provides the interface between users and the information system. Software can be divided into two generic types: system software and applications. The system software comprises of the operating system, utility programs and special purpose programs. Applications are developed to accomplish a specific task. For users of MIS it is much more important to understand the software than the hardware. Software maintenance can take 50 to 70 percent of all personnel activity in the MIS function. When the organization moves to implement an advanced information system the hardware and software environment becomes more complex.



**Database**

A database is a centrally controlled collection of organized data. Central control reduces redundancy and duplication of data. Data is stored in an organized and structured way to facilitate sharing and improve availability to those who need it. The database improves efficiency of storage by elimination of redundant files and improves efficiency of processing by providing all required data in a single file rather than separate files. This also improves efficiency of information retrieval.

**Procedures**

Three types of procedures are required for an MIS to operate effectively: user instructions, instructions for input preparation and operating instructions for MIS personnel who maintain the MIS.

**Personnel**

The personnel in the MIS function include computer operators, programmers, systems analysts and managers. Human resource requirements should be assessed by considering both the present system needs and the future system growth. The quality of MIS personnel is a key factor in its effectiveness. An MIS manager needs a combination of both managerial and technical skills.