System, Information system, MIS

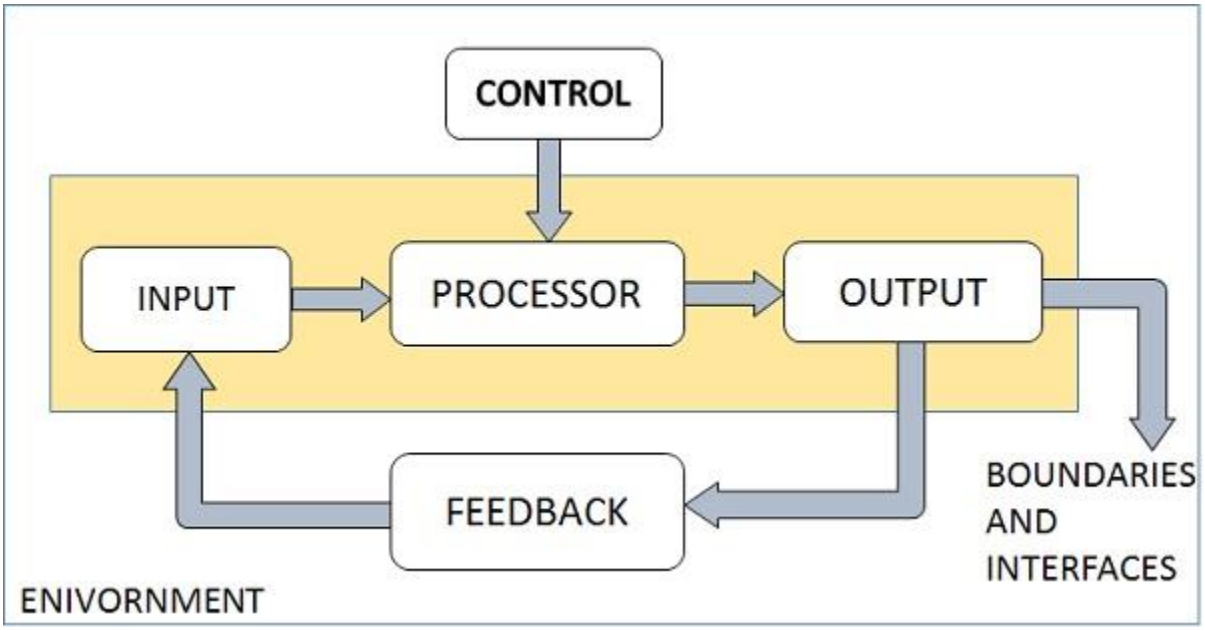
What is System

The key term used most frequently. Understanding systems and how they work is critical to understanding systems analysis and design.

Definition of a System and Its Parts

system is an interrelated set of business procedures (or components) used within one business unit, working together for some purpose. For example, a system in the payroll department keeps track of checks, whereas an inventory system keeps track of supplies. The two systems are separate. A system has nine characteristics. A detailed explanation of each characteristic follows, system exists within a larger world, an environment. A boundary separates the system from its environment. The system takes input from outside, processes it, and sends the resulting output back to its environment.

Elements of a System:



1. **Components:** An irreducible part or aggregation of parts that makes up a system; also called a subsystem.
2. **Interrelated components:** Dependence of one part of the system on one or more other system parts.
3. **Boundary:** The line that marks the inside and outside of a system and that sets off the system from its environment.
4. **Purpose:** The overall goal or function of a system.
5. **Environment:** Everything external to a system that interacts with the system.
6. **Interfaces:** Point of contact where a system meets its environment or where subsystems meet each other.
7. **Constraints:** A limit to what a system can accomplish.
8. **Input:** Inputs are the information that enters into the system for processing.
9. **Output:** The main objective of a system is to get an output which is helpful for its user. Output is the final outcome of processing.

Characteristics and types of system

- **Organization**
  - structure and order
  - Example: Hierarchical organization in a company.
  - Computer system: organization of various components like input devices, output devices, CPU and storage devices
- **Interaction**
  - Between sub systems or the components
  - Example: the main memory holds the data that has to be operated by the ALU.
- **Interdependence**
  - Component linkage
  - Component dependence
- **Integration**
  - How subsystems are tied together to achieve the system objective
- **Central Objective**
  - Should be known in early phases of analysis

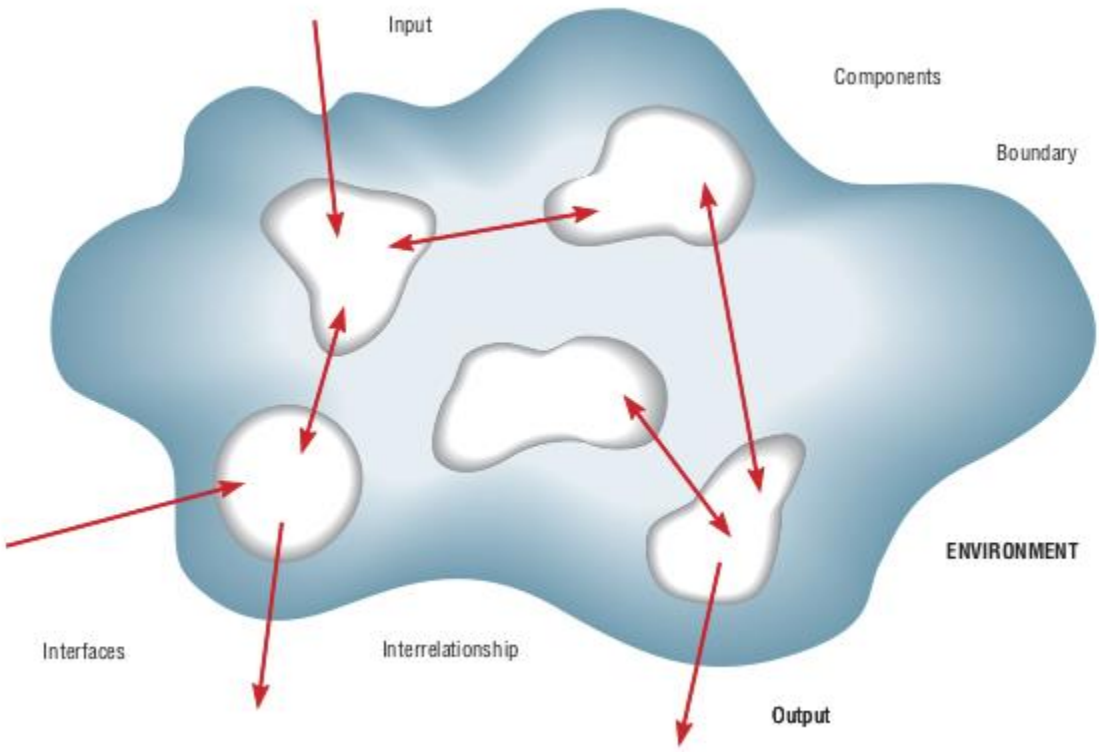


FIGURE 1-4
Seven characteristics of a system.

Types of Systems

- **Physical or Abstract System**
  - Physical system: tangible entities
  - static or dynamic in nature.
  - Example: system-computer center
  - Desks and chairs are the static parts
  - Programs, data, and applications can change according to the user's needs.
  - Abstract systems are conceptual. These are not physical entities. They may be formulas, representation or model of a real system.
- **Open Closed System- Majority of systems are open systems**
  - open system has many interfaces with its environment
  - can also adapt to changing environmental conditions
  - can receive inputs from, and delivers output to the outside of system
  - Closed systems: Systems that don't interact with their environment. Closed systems exist in concept only.

- **Manmade Information System**
  - Information system is the basis for interaction between the user and the analyst.
  - Main purpose-manage data for a particular organization.

Further Categorized as:

1. **Formal Information Systems**: Responsible for flow of information from top management to lower management But feedback can be given from lower authorities to top management
2. **Informal Information Systems**: Informal systems are employee based. These are made to solve the day to day work related problems.
3. **Computer-Based Information Systems**: This class of systems depends on the use of computer for managing business applications

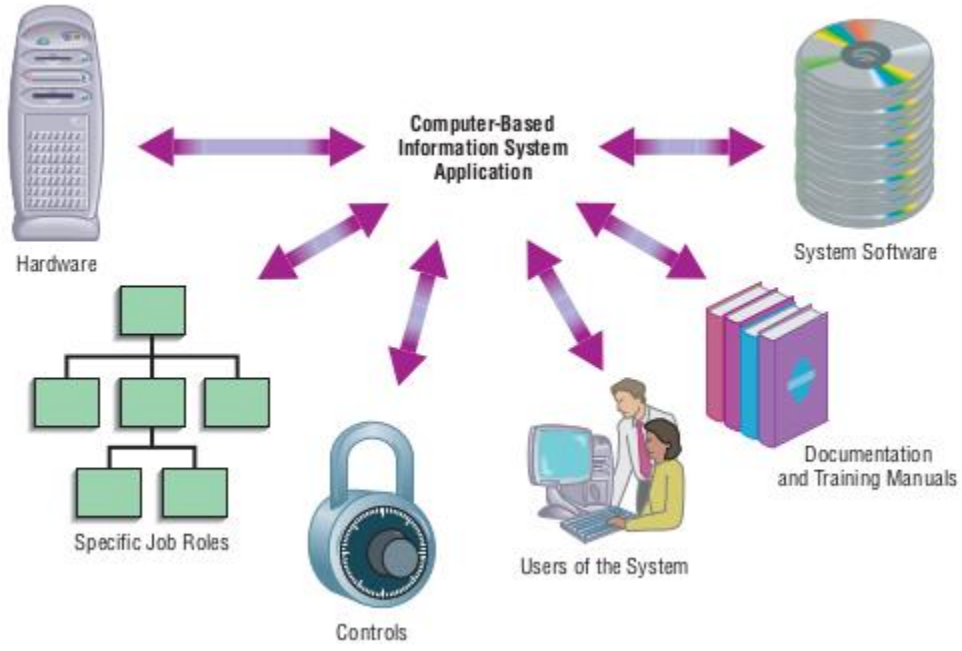


FIGURE 1-2
Components of a computer-based information system application.

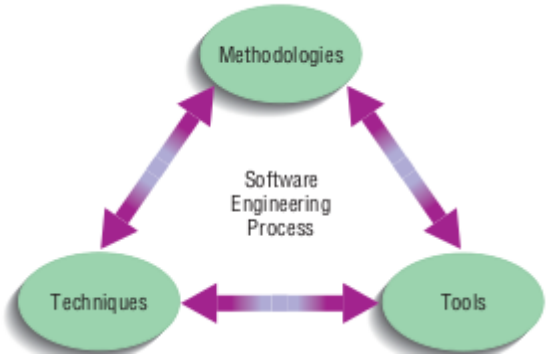


FIGURE 1-3
The software engineering process uses proven methodologies, techniques, and tools.

Information systems (IS)

in organizations capture and manage data to produce useful information that supports an organization and its employees, customers, suppliers, and partners. Many organizations consider Information systems to be essential to their ability to compete or gain competitive advamage. Most organizations have come to realize that ail workers need or participate in the development of information systems.

1. Transaction processing systems (TPSs)
2. Management Information systems (MISs)
3. Decision support systems (DSSs)
4. Executive information system (EIS)
5. Expert systems
6. Communications and collaboration system
7. Automation systems

- **Transaction processing systems (TPSs)** process business transactions such as orders, then cards, payments, and revelations.
- **Management Information systems (MISs)** use the transaction data to produce information needed by managers to run the business.
- **Decision support systems (DSSs)** help various decision makers Identify and choose between options or decisions.
- **Executive information system (EIS)** are tailored to the unique information needs of executives who plan for the business and assess performance against those plans.
- **Expert systems** capture and reproduce the knowledge of an expert problem solver or decision maker and then simulate the “thinking" of that expert.
- **Communications and collaboration system** enhance communication and collaboration between people, both Internal and external to the organization.
- Finally, office **automation systems** help employees create and share documents that support day-to-day often activities

Important Information System Concepts

Systems analysts need to know several other important systems concepts:

1. Decomposition
2. Modularity
3. Coupling
4. Cohesion

Decomposition

is the process of breaking down a system into its smaller components. These components may themselves be systems (subsystems) and can be broken down into their components as well. Decomposing a system also allows us to focus on one particular part of a system, making it easier to think of how to modify that one part independently of the entire system. Decomposition is a technique that allows the systems analyst to:

1. Break a system into small, manageable, and understandable subsystems
2. Focus attention on one area (subsystem) at a time, without interference from other areas. Concentrate on the part of the system pertinent to a particular group of users, without confusing users with unnecessary details
3. Build different parts of the system at independent times and have the help of different analysts

Modularity

is a direct result of decomposition. It refers to dividing a system into chunks or modules of a relatively uniform size. Modules can represent a system simply, making it easier to understand and easier to redesign and rebuild. For example, each of the separate subsystem modules for the MP3 player shows how decomposition makes it easier to understand the overall system.

Coupling

means that subsystems are dependent on each other. Subsystems should be as independent as possible. If one subsystem fails and other subsystems are highly dependent on it, the others will either fail themselves or have problems functioning. components of a portable MP3 player are tightly coupled. The best example is the control system, made up of the printed circuit board and its chips. Every function the MP3 player can perform is enabled by the board and the chips. A failure in one part of the circuit board would typically lead to replacing the entire board rather than attempting to isolate the problem on the board and fix it. Even though repairing a circuit board in an MP3 player is certainly possible, it is typically not cost-effective; the cost of the labor expended to diagnose and fix the problem may be worth more than the value of the circuit board itself. In a home stereo system, the components are loosely coupled because the subsystems, such as the speakers, the amplifier, the receiver, and the CD player, are all physically separate and function independently. If the amplifier in a home stereo system fails, only the amplifier needs to be repaired.

Cohesion

is the extent to which a subsystem performs a single function. In the MP3 player example, supplying power is a single function. This brief discussion of systems should better prepare you to think about computer-based information systems and how they are built. Many of the same principles that apply to systems in general apply to information systems as well. In the next section, we review how the information systems development process and the tools that have supported it have changed over the decades.

What is MIS?

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.

Management Information System

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

The system utilizes

- Computer hardware & software

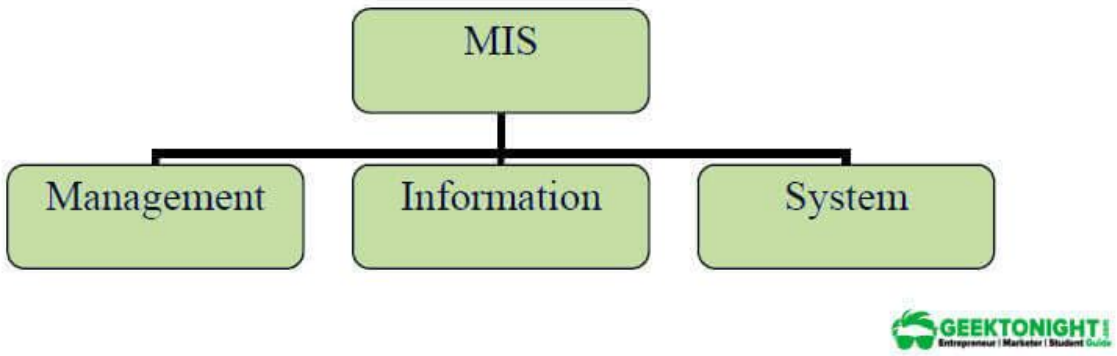
- Manual procedures
- Models for analysis, planning, control, and decision making, and
- A database

MIS Meaning

MIS meaning 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.

Components of MIS



Components of MIS

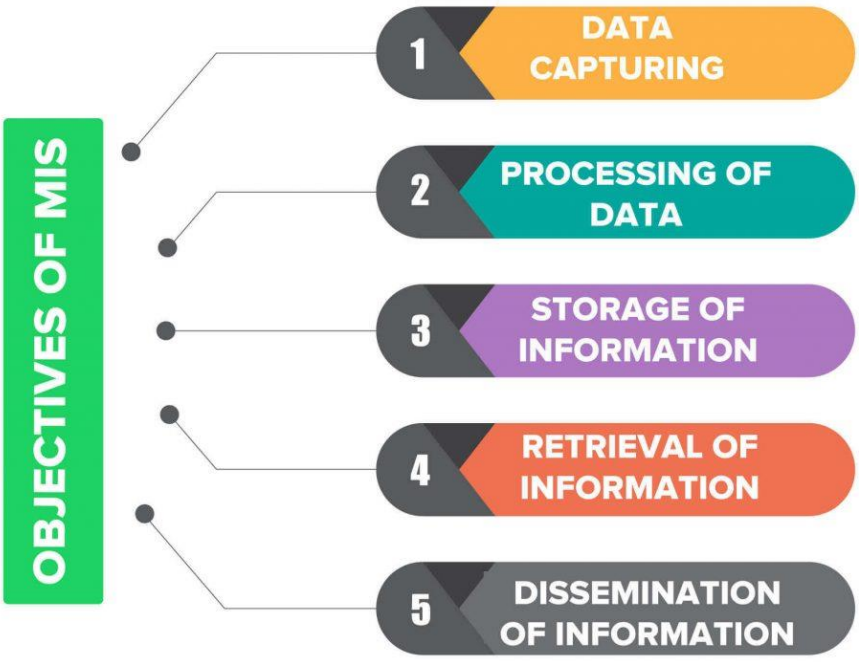
- **People Resources**: People are required for the operation of all information system.
- **Data Resources**: Database holds processed and organized data.
- **Software Resources**: It includes all sets of information processing

- instruction.
- **Hardware Resources**: Include all physical devices and materials used in information processing.
- **Process**: is a step undertaken to achieve a goal.

Objectives of MIS

What is MIS objective: MIS has five major objectives which include:

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



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These MIS objective are discussed below in detail.

Data Capturing

MIS capture data from various internal and external sources of the organization. Data capturing may be manual or through computer terminals.

Processing of Data

The captured data is processed to convert into the required information. Processing of data is done by such activities as calculating, sorting, classifying, and summarizing.

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.

Retrieval of Information

MIS retrieves information from its stores as and when required by various users.

Dissemination of Information

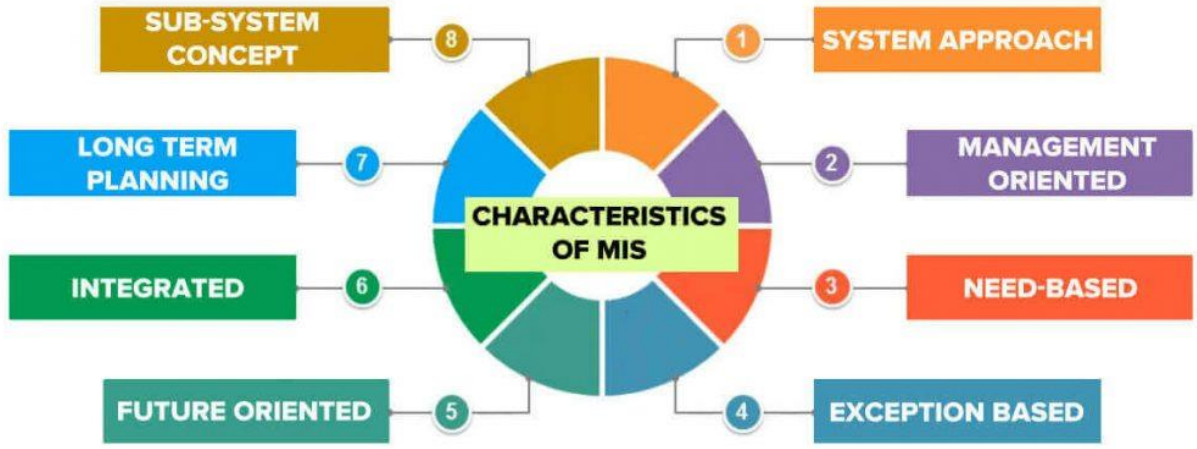
Information, which is a finished product of MIS, is disseminated to the users in the organization. It is periodic or online through a computer terminal.

Characteristics of MIS

What is MIS Characteristic? MIS plays a very important role in every aspect of an organization. These characteristics are generic in nature.

Following are the **characteristics of MIS**:

1. System Approach
2. Management Oriented
3. Need-Based
4. Exception Based
5. Future Oriented
6. Integrated
7. Long Term Planning
8. Sub-System Concept
9. Central Database



Characteristics of MIS

System Approach

The information system follows a System's approach. The system's approach implies a holistic approach to the study of system and its performance in the light for the objective for which it has been constituted.

Management Oriented

The top-down approach must be followed while designing the MIS. The top-down approach suggests that the system development starts from the determination of management needs and overall business objectives.

The MIS development plan should be derived from the overall business plan. Management oriented characteristic of MIS also implies that the management actively directs the system development efforts.

Need-Based

MIS design and development should be as per the information needs of managers at different levels, strategic planning level, management control level and operational control level. In other words, MIS should cater to the specific needs of managers in an organization's hierarchy.

Exception Based

MIS should be developed on the exception-based reporting principle, which means an abnormal situation, i.e. the maximum; minimum or expected values vary beyond tolerance limits. In such situations, there should BE exception reporting to the decision-maker at the required level.

Future Oriented

Besides exception-based reporting, MIS should also look at the future. In other words, MIS should not merely provide past or historical information; rather it should provide information, on the basis of projections based on which actions may be initiated.

Integrated

Integration is a necessary characteristic of a management information system. Integration is significant because of its ability to produce more meaningful information.

For example, in order to develop an effective production scheduling system, it is necessary to balance such factors as setup costs, Workforce, Overtime rates, Production capacity, Inventory level, Capital requirements and Customer services.

Long Term Planning

MIS is developed over relatively long periods. Such a system does not develop overnight. A heavy element of planning is involved. The MIS designer must have the future objectives and needs of the company in mind.

Sub-System Concept

The process of MIS development is quite complex and one is likely to lose insight frequently. Thus, the system, though viewed as a single entity, must be broken down into digestible sub-systems which are more meaningful at the planning stage.

Central Database

A central database is a mortar that holds the functional systems together. Each system requires access to the master file of data covering inventory, personnel, vendors, customers, etc. It seems logical to gather data once, validate it properly and place it on a central storage medium, which can be accessed by any other subsystem.

Advantage of MIS

A good management information system can be used not only for the storage of electronic data alone but must be able to support the analysis required by management. There are many **advantages of MIS** which are utilised by manager to achieve organization goal.

The following are some of the **benefits of a good MIS**.

- Increased **customer satisfaction**

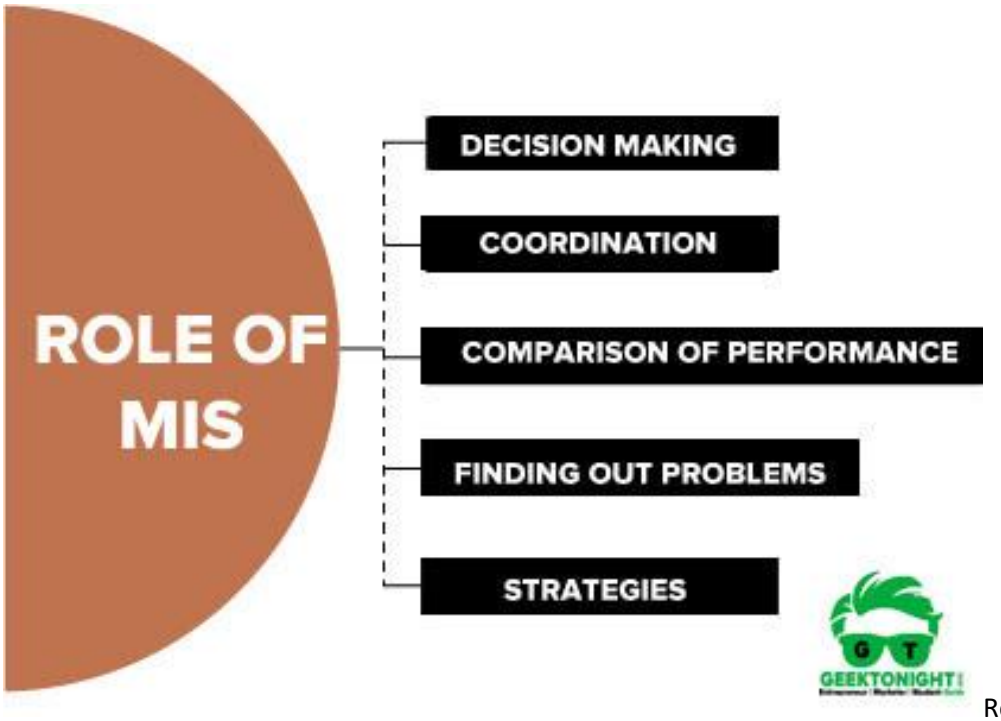
- Improved quantity and **quality of information**
- Improved quality and **quantity management decisions**
- Improved **responsiveness number of the competitor's condition**
- Improved **operational efficiency and flexibility**
- Improved **quality of internal and external communications**
- Improved **quality of planning**
- Improved **quality control and supervision**

Role of MIS

A management information system (MIS) plays an important role in business organizations.

What is MIS role: There are many roles of MIS and some of the important MIS role are discussed below:

1. **Decision making**
2. **Coordination among the department**
3. **Finding out Problems**
4. **Comparison of Business Performance**
5. **Strategies for an Organization**



Role of MIS

Decision making

Management Information System (MIS) plays a significant role in the decision-making process of any organization. In any organization, a decision is made on the basis of relevant information which can be retrieved from the MIS.

Coordination among the department

Management Information System satisfy multiple need of an organization across the different functional department.

Finding out Problems

As we know that MIS provides relevant information about every aspect of activities. Hence, if any mistake is made by the management then MIS, information will help in finding out the solution to that problem.

Comparison of Business Performance

MIS store all past data and information in its Database. That why the management information system is very useful to compare business organization performance.

Strategies for an Organization

Today each business is running in a competitive market. An MIS supports the organization to evolve appropriate strategies for the business to assent in a competitive environment.

Challenges of MIS

What is MIS Challenges: There are three major **challenges of MIS**: high cost, training of employees and maintenance cost. These are briefly discussed below:

1. **High Cost**
2. **Training of Employee**
3. **Maintenance Cost**

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.

Limitations of MIS

Even though MIS has many benefits but it also has its limitations. **Limitations of MIS** are discussed below:

- While MIS may solve some critical problems but it is **not a solution to all problems** of an organization.
- It **cannot meet the special demands** of each person.
- MIS if **designed in an improper manner** does not serve the management and hence is of little relevance.
- The MIS is **not good if the basic data is obsolete** and outdated.
- Mostly information provided by the MIS is in quantitive form. Hence, it **ignores the qualitative information** like the attitude of an employee.
