Chapter No. 1 Introduction to MIS

1.1 Concept, Evolution and meaning of MIS:

MIS has been understood and described in a number of ways. It is also popularly 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 given below:

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

- 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.

- 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.

- The MIS is defined as a Computer based Information System

The followings are the objectives of the MIS

1) To provide an overview of the information requirements of organizations.
2) To analyze the role of management and its dependency on information.
3) To discuss the role of information in the decision making process.
4) To identify the need for information in the day-to -day operations of an organization.

Evolution of MIS:-

Era	Period	Organizational Use	Technology used
First	1960-70	✓ IS were **centralized** and concerned solely with governance and needs of management, Most of the reports are under the control of Accounts Department.	✓ Third generation mainframe computers
Second	1970-80	✓ Still concerned with governance and needs of management, but more departments beginning to benefit from the technology. ✓ In many companies, steering committees determined the shape and scope of IS projects.	✓ Personal computers, ✓ Mini computers, ✓ Mid-range computers.
Third	1980-90	✓ Centralized IS began to spread out and information became **decentralized.** ✓ **New positions created (like Chief Information Officer)** to oversee the acquisition and management of multiple IS	✓ Networking, ✓ Beginning of Internet.

Fourth	1990 to Today	✓ Still tightly tied to Governance and Management. But now the systems are **widely distributed**. ✓ **Many IS** are **integrated** between different companies.	✓ Social media, ✓ Search engines, ✓ Mobile computing, ✓ Embedded systems
Fifth	Future	✓ Today any employee is in a position to make informed decision with tools that are readily available across multiple platforms. ✓ The line between **who produces and who consumes information from MIS is increasingly blurred.**	✓ Cloud Computing ✓ Big Data ✓ Artificial Intelligence ✓ Internet Of Things (IOT)

Information System for Competitive Advantage:

In Management Information Systems there are eight ways to gain competitive advantage: Reducing cost, raising barriers to market entrants, establishing high switching costs, creating new products or services, differentiating products or services, enhancing products or services, establishing alliances. Locking in suppliers or buyers Competitive Advantage in any industry or business venture is achieved when one particular organization performs more effectively and/or efficiently than the others in the same category.

This Competitive Advantage does not have to be all encompassing of the industry and may only cover small segments. A Competitive Advantage is achieved when an organization can do any one thing, process, function, etc. more effectively and or efficiently than others in that industry segment or in some cases across the entire industry. According to the authors W.R. King, V. Grove, and E.H. Hufnagel (1989), information technology is used as a strategic tool for companies to increase their competitive advantage at a time when uncertainty is growing. The idea that information technology can contribute to the optimization of enterprise resources, enhance, enable and enhance business performance. This idea was accepted and supported by many empirical studies.

Users of company information systems are important information resources that can provide a real contribution in achieving strategic goals in achieving competitive advantage. This is especially true when users can actively participate in system development and practice end-user computing. Users have different levels of computer knowledge and information knowledge. In deciding how the company will use information resources, top management must pay considerable attention to how end-user computing will be carried out, so that ultimately it will maximize its benefits and minimize the risks.A company is a physical system that is managed through the user

of a virtual system. A company takes its resources and environment, converts these resources into products and services, and returns resources that are converted back into the environment. The General System Model The company shows the flow of resources from the environment through the company and back in the environment. In the field of information systems, competitive advantage refers to the use of information to gain leverage in the market. Harvard Professor Michael E. Porter believes that a company achieves a competitive advantage by creating a value chain. Margin is the value of the company's products and services after deducting the cost of goods, as received by the company's customers. Increasing margins is the goal of the value chain.The company creates value by doing what Porter calls value activities. Value activities consist of two types: main and supporting Competitive advantages can be realized in terms of gaining strategic, tactical and operational excellence. When managers decide to use information to achieve competitive advantage, they must manage these resources in order to achieve the desired results. Information, like other resources, requires management. The four basic dimensions of desired information will be able to add value to the information, namely: Relevance, Accuracy, Timeliness and Completeness.

System Approach to problem solving:

By understanding 'systems thinking' as a world-view approach, its practical value emerges. The value itself is being able to use this world-view approach to observe a direct problem, while still understanding the wider interconnected situation that surrounds it. There is a process for undertaking this kind of problem solving. The benefits of this process is that it realises problems are rarely simple, instead they are rather complex and in need of well-considered solutions. While some people may insist that problems "aren't a big deal", this three minute video gives an insight into the value of 'systems thinking'. It's titled "*A Cautionary Tale*", and it shows the risks associated with using traditional thinking to solve what is considered to be a simple problem, but it overlooks the complex systems surrounding the problem itself.

'Systems thinking' as a process looks to achieve three objectives: (1) understand a system's dynamics—*analysis*; (2) understand a system's hierarchy—*synthesis*; and (3) develop solutions—*decision making*. These three elements make it possible to apply 'systems thinking' as a function for problem solving.
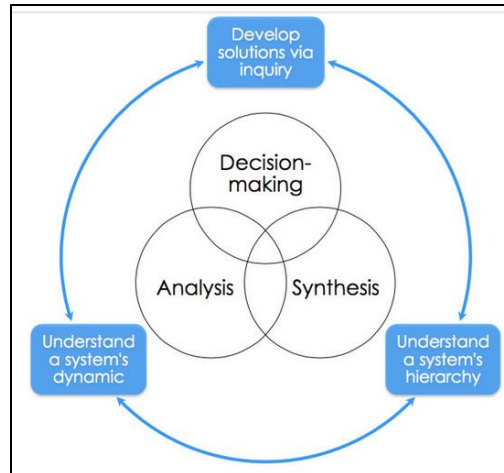
Fig.: System Approach to problem solving

Types of System:

A) Open versus Closed System:

   An **open system** is a system that has external interactions. Such interactions can take the form of information, energy, or material transfers into or out of the system boundary, depending on the discipline which defines the concept. An open system is contrasted with the concept of an isolated system which exchanges neither energy, matter, nor information with its environment. An open system is also known as a flow system.

   A **closed system** is a physical system that does not allow transfer of matter in or out of the system, though, in different contexts, such as physics, chemistry or engineering, the transfer of energy is or is not allowed.

   In a closed system, there is very little sharing between the various components of the organization and certainly little to no interaction with the environment outside of the organization. Each component performs its functions without communicating its activities to the other components of the organization. Sometimes, the need for a closed environment exists if the organization is working on developing a new product, idea, or concept.

B) Probabilistic versus Deterministic System:

   A deterministic system is one in which the occurrence of all events is known with certainty. If the description of the system state at a particular point of time of its operation is given, the next state can be perfectly predicted.

   A system is deterministic if its outputs are certain. This means that the relationships between its components are fully known and certain. Hence, when an input is given the

output is fully predictable. An example of a deterministic system is the common entrance examination for entry into IIM. All the entities in the system and their interrelationships are well known and given an input the output can be determined with certainty.

A probabilistic system is one in which the occurrence of events cannot be perfectly predicted. Though the behavior of such a system can be described in terms of probability, a certain degree of error is always attached to the prediction of the behavior of the system.

A probabilistic system is one where the output from the system behaves probabilistically, i.e., the output is predictable according to probability values. The portfolio investment systems of an asset management company that invests in the stock market will have a probabilistic output for a given input as the system and its entities behave probabilistically.

C) Natural versus Man-made Systems:

The vast majority of systems are not made by people: they exist in nature and, by and large, serve their own purpose. It is convenient to divide natural systems into two basic subcategories: physical systems and living systems. Physical systems include such diverse examples as:

- ✓ Stellar systems: galaxies, solar systems, and so on;
- ✓ Geological systems: rivers, mountain ranges, and so on; and
- ✓ Molecular systems: complex organizations of atoms.

Living systems, of course, encompass all of the myriad animals and plants around us, as well as our own human race.

A number of systems are constructed, organized, and maintained by humans. These include such things as:

- ✓ Social systems: organizations of laws, doctrines, customs, and so on.
- ✓ Transportation systems: networks of highways, canals, airlines, ocean tankers, and the like.
- ✓ Communication systems: telephone, telex, smoke signals, the hand signals used by stock market traders, and so on.
- ✓ Manufacturing systems: factories, assembly lines, and so on.
- ✓ Financial systems: accounting, inventory, general ledger, stock brokerage, and the like.

Subsystems:

A **Subsystem** is a system in its own right, except it normally will not provide a useful function on its own, it must be integrated with other subsystems to make a system. Therefore, *interfaced* or connecting subsystems are required to make-up the system. In the literature a particular subsystem may be called either a "subsystem" or a "system"; this is often simply a naming choice made by the project manager or the systems engineer. For example, NASA named the orbiter, external tank and solid rocket boosters (SRB) the Space Transport System (STS) in Figure 2. The orbiter itself is called a system (although it is a subsystem of the STS), which itself has subsystems for avionics, thermal protection, etc. Normally, the orbiter needs the other two subsystems (external tank plus SRBs) to be launched, but it had been launched as a glider from a 747 (albeit this was for testing purposes at the time rather than a purposeful mission). In the same way, the SRBs can be used to launch a small useful payload all by itself. Although you might not think it, an astronaut could be called a subsystem.

Following are the subsystems of Management Information System:

1. Transaction Processing System
2. Management Reporting System
3. Decision Support System
4. Office Information System
5. Business Expert System

MIS function in an organization:

An information system contains information about an organisaton and its surrounding environment. Three basic activities – Input, Processing and Output produce the information organization needs. Feedback is output returned to appropriate people or activities in the organization to evaluate and refine the input environment factors.

Fig: Function of an Information System
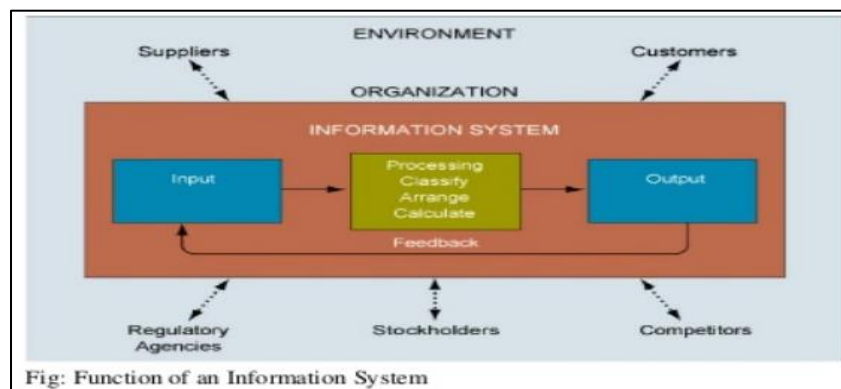
It is widely recognized that information system knowledge is essentials for managers because most of the organization need information system to survive and develop. Information system can help company's extend to reach far away location and by that change the way they conduct the business.
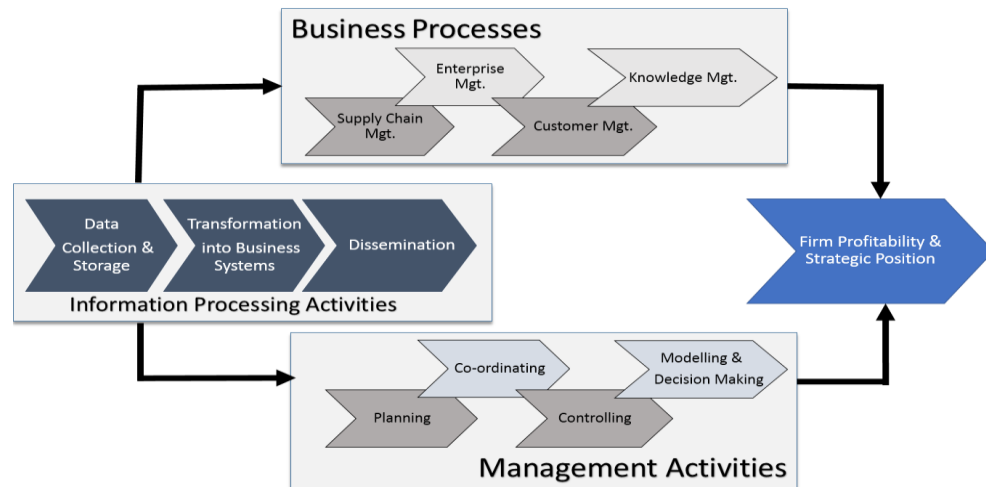

Fig.: Business perspective on Information System

From the business perspective information system are part of value adding activities for acquiring, transforming and distributing activities information that managers can use to improve decision making, enhance organizational performance and ultimately increase firm profitability and strategic position.

MIS is the information system at the management level of the organization that serve the function of planning, controlling and decision making by providing routine summary and exception reports.

Challenges in the development of MIS:

Factors contributing to failures: Many times, MIS is a failure. The common factors which are responsible for this are as follows:

1) MIS is conceived as a data processing and not as an information system.

2) MIS does not provide that information which in needed by managers but it tends to provide the information generally the function calls for. MIS then becomes an impersonal function.

3) Understanding the complexity in the business systems and not recognizing it in the MIS design leads to problems in the successful implementation.

4) Adequate attention is not given to the quality control aspects of the inputs, the process and the outputs leading to insufficient checks and controls in MIS.

5) MIS is developed without streamlining the transaction processing systems in the organizations.

6) Lack of training and appreciation that the users of the information and the generators of the data are different, and they have to play an important role in the MIS.

7) MIS does not meet certain critical and key factors of its users, such as a response to the query on the database, an inability to get the processing done in a particular manner, lack of user friendly system and the dependence on the system personnel.

8) A belief that the computerized MIS can solve all the management problems of planning and control of the business.

9) Lack of administrative discipline in following the standardized systems and procedures, wrong coding and deviating from the system specifications result in incomplete and incorrect information.

10) MIS does not give perfect information to all users in the organization. Any attempt toward such a goal will be unsuccessful because every user has a human ingenuity, bias and certain assumptions not known to the designer. MIS cannot make up these by providing perfect information.