

What is MIS? Introduction & Definition

What is 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.

The need for MIS

The following are some of the justifications for having an MIS system

- **Decision makers need information to make effective decisions.** Management Information Systems (MIS) make this possible.
- **MIS systems facilitate communication within and outside the organization** – employees within the organization are able to easily access the required information for the day to day operations. Facilitates such as Short Message Service (SMS) & Email make it possible to communicate with customers and suppliers from within the MIS system that an organization is using.
- **Record keeping** – management information systems record all business transactions of an organization and provide a reference point for the transactions.

Components of MIS

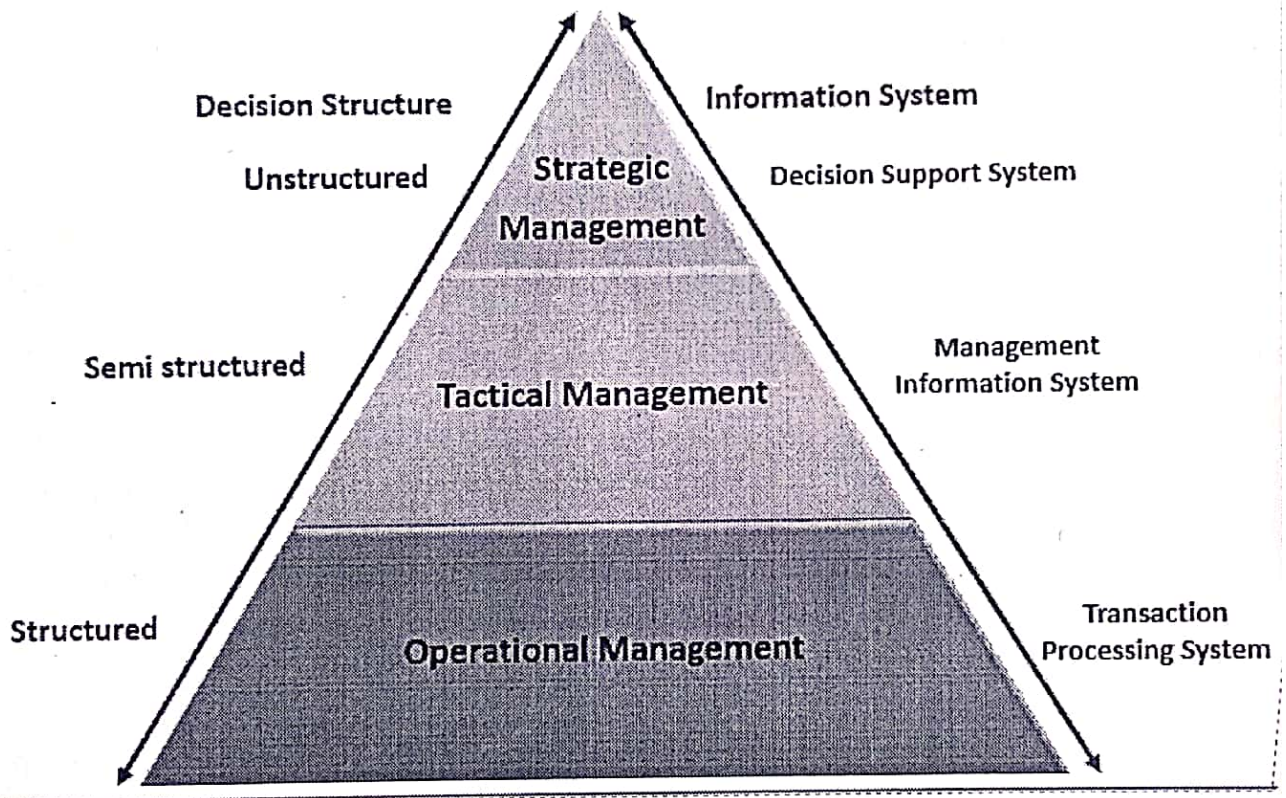
The major components of a typical management information system are:

- **People** – people who use the information system
- **Data** – the data that the information system records
- **Business Procedures** – procedures put in place on how to record, store and analyze data

- Hardware – these include servers, workstations, networking equipment, printers, etc.
- Software – these are programs used to handle the data. These include programs such as spreadsheet programs, database software, etc.

Types of Information Systems

The type of information system that a user uses depends on their level in an organization. The following diagram shows the three major levels of users in an organization and the type of information system that they use.



Transaction Processing Systems (TPS)

This type of information system is used to record the day to day transactions of a business. An example of a Transaction Processing System is a Point of Sale (POS) system. A POS system is used to record the daily sales.

Management Information Systems (MIS)

Management Information Systems are used to guide tactic managers to make semi-structured decisions. The output from the transaction processing system is used as input to the MIS system.

Decision Support Systems (DSS)

Decision support systems are used by top level managers to make semi-structured decisions. The output from the Management Information System is used as input to the decision support system. DSS systems also get data input from external sources such as current market forces, competition, etc.

Manual Information Systems VS Computerized Information Systems (MIS)

Data is the bloodstream of any business entity. Everyone in an organization needs information to make decisions. An information system is an organized way of recording, storing data, and retrieving information.

In this section, we will look at manual information systems vs. computerized information systems.

Manual Information System

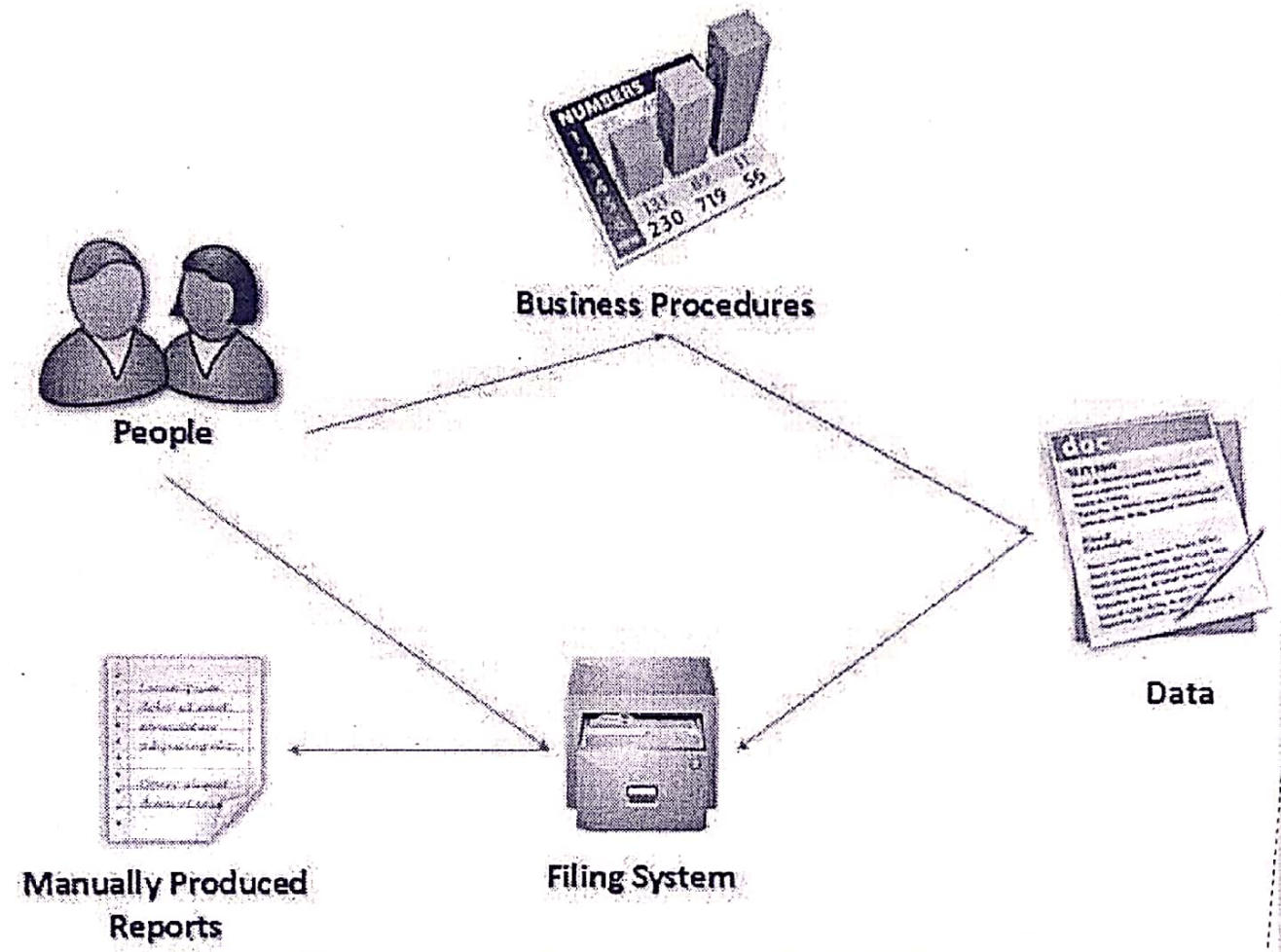
A manual information system does not use any computerized devices. The recording, storing and retrieving of data is done manually by the people, who are responsible for the information system.

The following are the major components of a manual information system

- People –people are the recipients of information system
- Business Procedures –these are measures put in place that define the rules for processing data, storing it, analyzing it and producing information
- Data –these are the recorded day to day transactions
- Filing system – this is an organized way of storing information

- Reports –the reports are generated after manually analyzing the data from the filing system and compiling it.

The following diagram illustrates how a typical manual information system works



Advantages and Dis-advantages of a manual information system

Advantages:

The following are the advantages of manual information systems

- Cost effective – it is cheaper compared to a computerized system because there is no need to purchase expensive equipment such as servers, workstations, printers, etc.

- Flexible –evolving business requirements can easily be implemented into the business procedures and implemented immediately

Disadvantages:

The following are some of the disadvantages of a manual information system.

- Time consuming –all data entries need to be verified before filing, this is a time consuming task when done by humans. Retrieving data from the filing system also takes a considerable amount of time
- Prone to error – the accuracy of the data when verified and validated by human beings is more prone to errors compared to verification and validation done by computerized systems.
- Lack of security – the security of manual systems is implemented by restricting access to the file room. Experience shows unauthorized people can easily gain access to the filing room
- Duplication of data –most departments in an organization need to have access to the same data. In a manual system, it is common to duplicate this data to make it easy to accessible to all authorized users. The challenge comes in when the same data needs to be updated
- Data inconsistency – due to the duplication of data, it is very common to update data in one file and not update the other files. This leads to data inconsistency
- Lack of backups – if the file get lost or mishandled, the chances of recovering the data are almost zero.

Computerized information system

Computerized systems were developed to address the challenges of manual information systems. The major difference between a manual and computerized information system is a computerized system uses a combination of software and hardware to record, store, analyze and retrieve information.

Advantages and Disadvantages of a computerized information system (MIS)

advantages and

The following are some of the disadvantages of a computerized information system.

Advantages:

The following are the advantages of computerized information systems

- Fast data processing and information retrieval – this is one of the biggest advantages of a computerized information system. It processes data and retrieves information at a faster rate. This leads to improved client/customer service
- Improved data accuracy – easy to implement data validation and verification checks in a computerized system compared to a manual system.
- Improved security – in addition to restricting access to the database server, the computerized information system can implement other security controls such as user's authentication, biometric authentication systems, access rights control, etc.
- Reduced data duplication – database systems are designed in such a way that minimized duplication of data. This means updating data in one department automatically makes it available to the other departments
- Improved backup systems – with modern day technology, backups can be stored in the cloud which makes it easy to recover the data if something happened to the hardware and software used to store the data
- Easy access to information – most business executives need to travel and still be able to make a decision based on the information. The web and Mobile technologies make accessing data from anywhere possible.

Disadvantages:

- It is expensive to set up and configure – the organization has to buy hardware and the required software to run the information

system. In addition to that, business procedures will need to be revised, and the staff will need to be trained on how to use the computerized information system.

- Heavy reliance on technology – if something happens to the hardware or software that makes it stop functioning, then the information cannot be accessed until the required hardware or software has been replaced.
- Risk of fraud – if proper controls and checks are not in place, an intruder can post unauthorized transactions such as an invoice for goods that were never delivered, etc.

Summary

- MIS is the acronym for Management Information System. It is a collection of people, procedures, data, and information technology that aids managers to make informed decisions.
- Computerized information systems are more efficient compared to manual information systems. Manual information systems are cheaper compared to computerized information systems.
- Transaction processing systems (TPS) are by operational staff to record day to day business transactions, and they are used to make structured decisions
- Management Information Systems (MIS) are used by middle-level managers to make semi-structured decisions
- Decision Support Systems are used by top level managers, and they help top level managers to make unstructured decisions

Components & Role of MIS (Management Information System)

Facebook is one of the most profitable businesses in the world, and its entire existence depends on the use of information technology and information systems.

Other successful companies such as Google, Amazon, eBay, and Financial Institutions- most of their success is due to technology.

This tutorial will look at the roles of MIS in the organization and how an organization can take advantage of MIS to gain competitive advantage.

In this tutorial, you will learn-

- Definition of data and information and characteristics of good information
- Competitive advantage of information and MIS
- Components of MIS and their relationship
- Porter's Value chain
- Influence of IT on organizational goals

Definition of data and information and characteristics of good information

Data refers to raw basic facts i.e. price of a product, the number of products purchased, etc. that haven't yet been processed.

For example, a price of \$6 and a quantity of 10 do not convey any meaning to a customer at a point of sale till. Information should be processed data that conveys meaning to the recipient.

For example, multiplying \$6 by 10 gives us \$60, which is the total bill that the customer should pay.

Good information should be timely and available when it is needed.

The following are the characteristics of good information.

- **Accurate** – information must be free from errors and mistakes. This is achieved by following strict set standards for processing data into information. For example, adding \$6 + 10 would give us

inaccurate information. Accurate information for our example is multiplying \$6 by 10.

- **Complete** – all the information needed to make a good decision must be available. Nothing should be missing. If TAX is an application to the computation of the total amount that the customer should pay then, it should be included as well. Leaving it out can mislead the customer to think they should pay \$60 only when in actual fact, they must pay tax as well.
- **Cost Effective** – the cost of obtaining information must not exceed the benefit of the information in monetary terms.
- **User-focused** – the information must be presented in such a way that it should address the information requirements of the target user. For example, operational managers required very detailed information, and this should be considered when presenting information to operational managers. The same information would not be appropriate for senior managers because they would have to process it again. To them, it would be data and not information.
- **Relevant** – the information must be relevant to the recipient. The information must be directly related to the problem that the intended recipient is facing. If the ICT department wants to buy a new server, information that talks about a 35% discount on laptops would not be relevant in such a scenario.
- **Authoritative** – the information must come from a reliable source. Let's say you have a bank account and you would like to transfer money to another bank account that uses a different currency from yours. Using the exchange rate from a bureau de change would not be considered authoritative compared to getting the exchange rate directly from your bank.
- **Timely** – information should be available when it is needed. Let's say your company wants to merge with another company. Information that evaluates the other company that you want to merge with must be provided before the merger, and you must have sufficient time to verify the information.

Competitive advantage of information and MIS

Competitive advantage is a position that makes a business more profitable than its competitors. For example, producing products at a lower cost than your competitors makes you more profitable.

Information systems have the capacity to help an organization into such a position. They do so in the following ways

Operational excellence – operational excellence seeks to improve the operations of the business. Let's take an example of a retail store. A retail store can use information systems to automatically place an order with a supplier once the inventory level reaches the re-order limit. This ensures that the retail store never runs out of inventory and customers can always count on it to find what they need.

New business models, products, and services – let's continue with the example of a retail store. The retail store can develop a web based order system or smartphone application that clients can use to buy items from the comfort of their homes or wherever they are. The order system can be linked to a delivery business and have support for online payments. This is a new business model compared to customers walking in to make purchases vs doing it from web based or smartphone apps.

Improved supplier and customer relations – historical data is used to understand the needs of the customers and suppliers. This data is then used to create services and products that address the needs. This leads to long-term relationships with customers and business which puts an organization in a more profitable position.

Improved decision making – information is critical when making decisions. Information systems if designed and operated efficiently, output information that has all the characteristic of good information described in the above section. This enables an organization to make decisions that will profit the organizations.

Components of MIS and their relationship

A management information system is made up of five major components namely people, business processes, data, hardware, and software. All of these components must work together to achieve business objects.

People – these are the users who use the information system to record the day to day business transactions. The users are usually qualified professionals such as accountants, human resource managers, etc. The ICT department usually has the support staff who ensure that the system is running properly.

Business Procedures – these are agreed upon best practices that guide the users and all other components on how to work efficiently. Business procedures are developed by the people i.e. users, consultants, etc.

Data – the recorded day to day business transactions. For a bank, data is collected from activities such as deposits, withdrawals, etc.

Hardware – hardware is made up of the computers, printers, networking devices, etc. The hardware provides the computing power for processing data. It also provides networking and printing capabilities. The hardware speeds up the processing of data into information.

Software – these are programs that run on the hardware. The software is broken down into two major categories namely system software and applications software. System software refers to the operating system i.e. Windows, Mac OS, and Ubuntu, etc. Applications software refers to specialized software for accomplishing business tasks such as a Payroll program, banking system, point of sale system, etc.

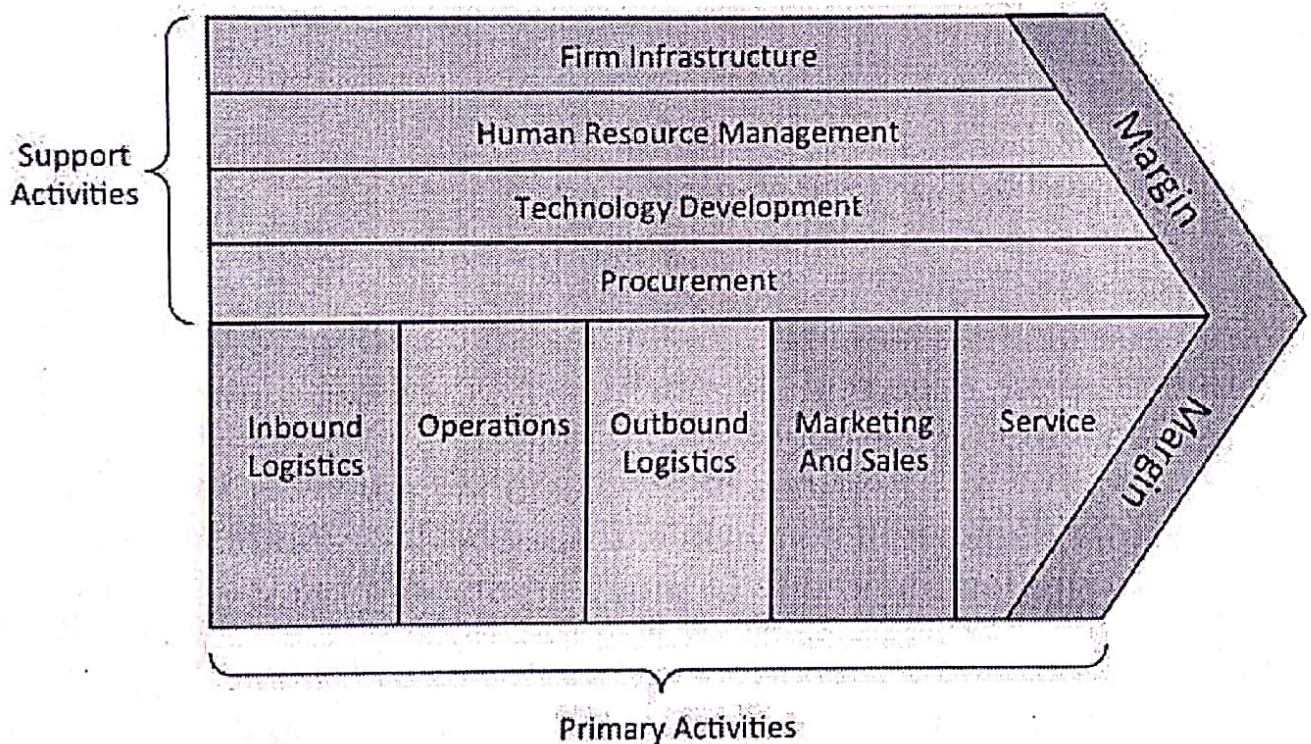
Porter's Value chain

Think of a company such as Apple Inc. Why are they successful? Why do customers love and buy the iPhone? It is because the iPhone adds value to their lives. This is why Apple Inc. is a successful business. Value chain refers to activities that a company performs to create value for its customers.

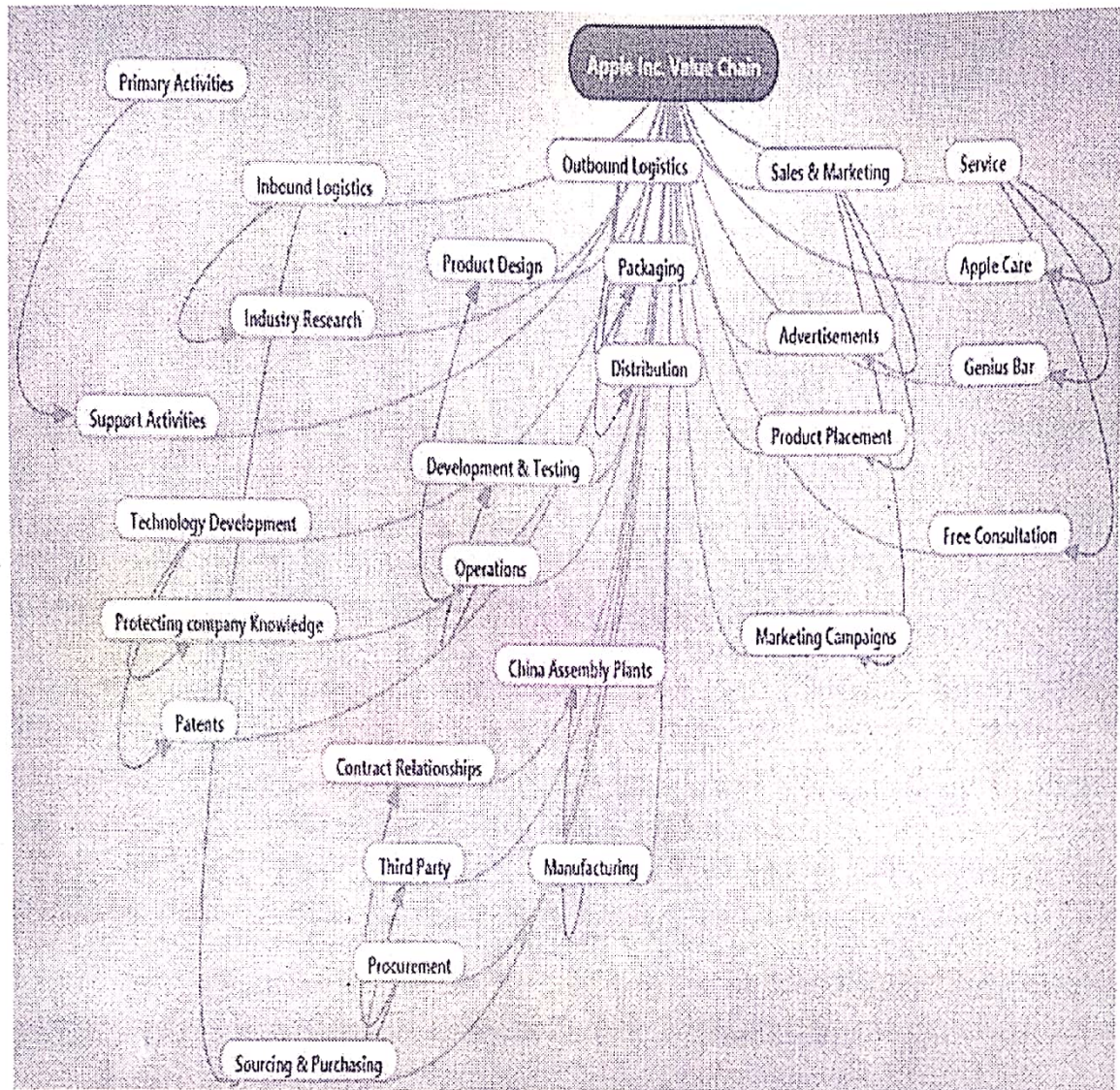
The concept of a value chain was developed by Michael Porter. Porter's value chain has two activities namely;

- **Primary activities** – these are activities that are related to the creating products/services, marketing and sales, and support. Primary activities consist of inbound logistics, operations, outbound logistics, marketing and sales, and service.
- **Support activities** – these are activities that support the primary activities. Support activities consist of procurement (purchasing), human resource management, technological development and infrastructure.

The following diagram depicts the value chain



The following illustration shows the value chain for Apple Inc.



The overall goal of the value chain is to help a business gain competitive advantage. Competitive advantage is a business's position in a market that makes it to be more profitable than its direct competitors.

Influence of IT on organizational goals

Organizational goals refer to objectives and the mission of the organization, especially in the long term. Regardless of the type of business that an organization engages in, the overall goal is to create value for the customers or clients as stated in the above section.

Business Information Technology alignment is concerned with using information technology to effectively achieve business goals.

Two of the most common ways that an organization can provide value is by offering a quality product at a lower price than the competitor or at a high price but with more features that add value to the customers.

Information technology enables businesses to process and analyze large amounts of data at a cheaper cost and within the shortest possible time. This enables organizations to provide quality products at a cheaper price.

Let's take a bank example. A bank can use ATM to allow the clients to withdraw money and other automated means to deposit money. Customers with queries can be directed to a website that has frequently asked questions. Both individuals and businesses can view the statements online if they subscribe to internet banking.

The above IT business practices lead to reduced costs of doing business and creating new products and services. Reduced cost of doing business enables a bank to reduce the bank charges, therefore, offering a quality product or service at a cheaper rate.

Summary:

Business entities exist to make profits. Not for profit organizations exist to deliver quality services or products cost effectively.

Regardless of the type of organization, MIS has a major role to play in achieving the objectives.

MIS enables organizations to make sound decisions by providing decision makers with information.

Management Information System

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

Information System

- "Information systems (IS) is the study of complementary networks of hardware and software that people and organizations use to collect, filter, process, create, and distribute data."
- "Information systems are combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful data, typically in organizational settings."
- "Information systems are interrelated components working together to collect, process, store, and disseminate information to support decision making, coordination, control, analysis, and visualization in an organization."

Information can be defined as meaningfully interpreted data. If we give you a number 1-212-290-4700, it does not make any sense on its own. It is just a raw data. However if we say Tel: +1-212-290-4700, it starts making sense. It becomes a telephone number. If I gather some more data and record it meaningfully like:

Address: 350 Fifth Avenue, 34th floor
New York, NY 10118-3299 USA
Tel: +1-212-290-4700
Fax: +1-212-736-1300

It becomes a very useful information - the address of New York office of Human Rights Watch, a non-profit, non-governmental human rights organization.

So, from a system analyst's point of view, information is a sequence of symbols that can be construed to a useful message.

An **Information System** is a system that gathers data and disseminates information with the sole purpose of providing information to its users.

The main object of an information system is to provide information to its users. Information systems vary according to the type of users who use the system.

A **Management Information System** is an information system that evaluates, analyzes, and processes an organization's data to produce meaningful and useful information based on which the management can take right decisions to ensure future growth of the organization.

Information Definition

"Information can be recorded as signs, or transmitted as signals. Information is any kind of event that affects the state of a dynamic system that can interpret the information."

Conceptually, information is the message (utterance or expression) being conveyed. Therefore, in a general sense, information is "Knowledge communicated or received, concerning a particular fact or circumstance". Information cannot be predicted and resolves uncertainty."

Information Vs Data

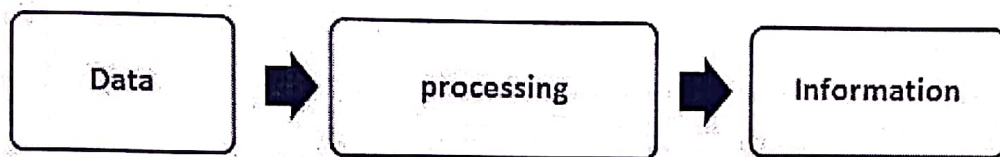
Data can be described as unprocessed facts and figures. Plain collected data as raw facts cannot help in decision-making. However, data is the raw material that is organized, structured, and interpreted to create useful information systems.

Data is defined as 'groups of non-random symbols in the form of text, images, voice representing quantities, action and objects'.

Information is interpreted data; created from organized, structured, and processed data in a particular context.

According to **Davis and Olson**:

"Information is a data that has been processed into a form that is meaningful to recipient and is of real or perceived value in the current or the prospective action or decision of recipient."



Information, Knowledge and Business Intelligence

Professor Ray R. Larson of the School of Information at the University of California, Berkeley, provides an *Information Hierarchy*, which is:

- Data - The raw material of information.
- Information - Data organized and presented by someone.
- Knowledge - Information read, heard, or seen, and understood.
- Wisdom - Distilled and integrated knowledge and understanding.

Scott Andrews' explains *Information Continuum* as follows:

- Data - A Fact or a piece of information, or a series thereof.
- Information - Knowledge discerned from data.
- Business Intelligence - Information Management pertaining to an organization's policy or decision-making, particularly when tied to strategic or operational objectives.

Information/Data Collection Techniques

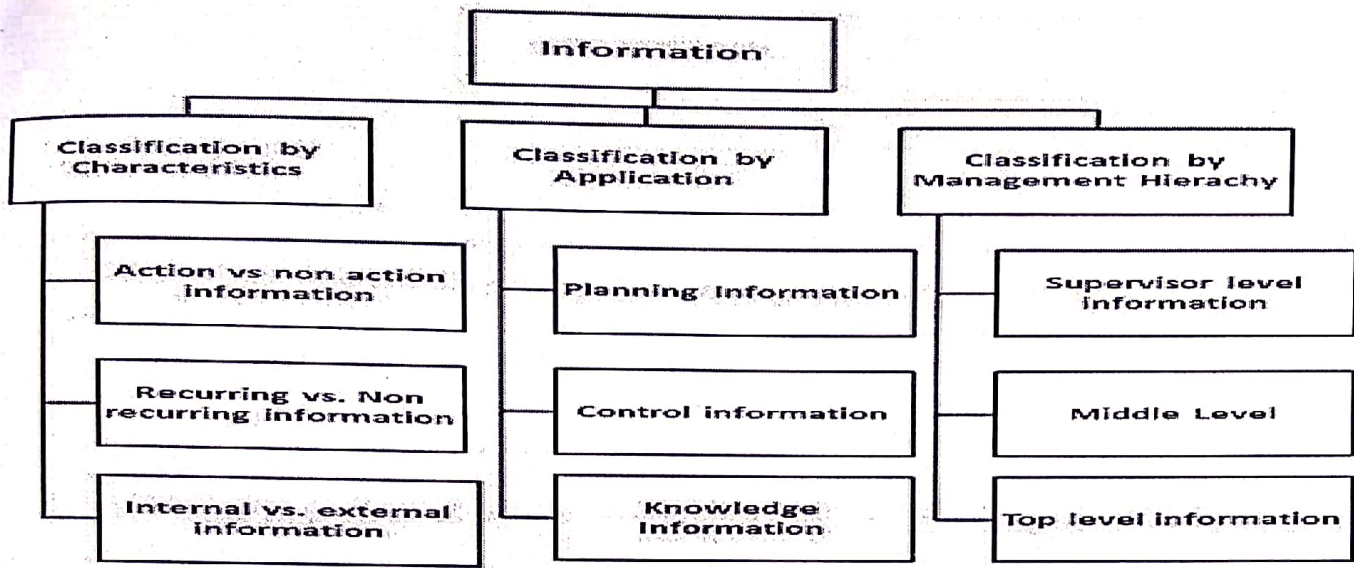
The most popular data collection techniques include:

- Surveys: A questionnaires is prepared to collect the data from the field.
- Secondary data sources or archival data: Data is collected through old records, magazines, company website etc.
- Objective measures or tests: An experimental test is conducted on the subject and the data is collected.

- Interviews: Data is collected by the system analyst by following a rigid procedure and collecting the answers to a set of pre-conceived questions through personal interviews.

Types of Information!
Information can be classified in a number of ways and in this chapter, you will learn two of the most important

ways to classify information.



Classification by Characteristic

Based on Anthony's classification of Management, information used in business for decision-making is generally categorized into three types:

- ✓ Strategic Information: Strategic information is concerned with long term policy decisions that defines the objectives of a business and checks how well these objectives are met. For example, acquiring a new plant, a new product, diversification of business etc, comes under strategic information.
- ✓ Tactical Information: Tactical information is concerned with the information needed for exercising control over business resources, like budgeting, quality control, service level, inventory level, productivity level etc.
- ✓ Operational Information: Operational information is concerned with plant/business level information and is used to ensure proper conduction of specific operational tasks as planned/intended. Various operator specific, machine specific and shift specific jobs for quality control checks comes under this category.

Classification by Application

In terms of applications, information can be categorized as:

- Planning Information: These are the information needed for establishing standard norms and specifications in an organization. This information is used in strategic, tactical, and operation planning of any activity. Examples of such information are time standards, design standards.
- Control Information: This information is needed for establishing control over all business activities through feedback mechanism. This information is used for controlling attainment, nature and utilization of

important processes in a system. When such information reflects a deviation from the established standards, the system should induce a decision or an action leading to control.

- **Knowledge Information:** Knowledge is defined as "information about information". Knowledge information is acquired through experience and learning, and collected from archival data and research studies.
- **Organizational Information:** Organizational information deals with an organization's environment, culture in the light of its objectives. Karl Weick's Organizational Information Theory emphasizes that an organization reduces its equivocality or uncertainty by collecting, managing and using these information prudently. This information is used by everybody in the organization; examples of such information are employee and payroll information.
- **Functional/Operational Information:** This is operation specific information. For example, daily schedules in a manufacturing plant that refers to the detailed assignment of jobs to machines or machines to operators. In a service oriented business, it would be the duty roster of various personnel. This information is mostly internal to the organization.
- **Database Information:** Database information construes large quantities of information that has multiple usage and application. Such information is stored, retrieved and managed to create databases. For example, material specification or supplier information is stored for multiple users.

Information is a vital resource for the success of any organization. Future of an organization lies in using and disseminating information wisely. Good quality information placed in right context in right time tells us about opportunities and problems well in advance.

Good quality information: Quality is a value that would vary according to the users and uses of the information.

According to Wang and Strong, following are the dimensions or elements of Information Quality:

- **Intrinsic:** Accuracy, Objectivity, Believability, Reputation
- **Contextual:** Relevancy, Value-Added, Timeliness, Completeness, Amount of information
- **Representational:** Interpretability, Format, Coherence, Compatibility
- **Accessibility:** Accessibility, Access security

Various authors propose various lists of metrics for assessing the quality of information. Let us generate a list of the most essential characteristic features for information quality:

- **Reliability** - It should be verifiable and dependable.
- **Timely** - It must be current and it must reach the users well in time, so that important decisions can be made in time.
- **Relevant** - It should be current and valid information and it should reduce uncertainties.

- **Accurate** - It should be free of errors and mistakes, true, and not deceptive.
- **Sufficient** - It should be adequate in quantity, so that decisions can be made on its basis.
- **Unambiguous** - It should be expressed in clear terms. In other words, it should be comprehensive.
- **Complete** - It should meet all the needs in the current context.
- **Unbiased** - It should be impartial, free from any bias. In other words, it should have integrity.
- **Explicit** - It should not need any further explanation.
- **Comparable** - It should be of uniform collection, analysis, content, and format.
- **Reproducible** - It could be used by documented methods on the same data set to achieve a consistent result.

Information processing beyond doubt is the dominant industry of the present century. Following factors states few common factors that reflect on the needs and objectives of the information processing:

- Increasing impact of information processing for organizational decision making.
- Dependency of services sector including banking, financial organization, health care, entertainment, tourism and travel, education and numerous others on information.
- Changing employment scene world over, shifting base from manual agricultural to machine-based manufacturing and other industry related jobs.
- Information revolution and the overall development scenario.
- Growth of IT industry and its strategic importance.
- Strong growth of information services fuelled by increasing competition and reduced product life cycle.
- Need for sustainable development and quality life.
- Improvement in communication and transportation brought in by use of information processing.
- Use of information processing in reduction of energy consumption, reduction in pollution and a better ecological balance in future.
- Use of information processing in land record managements, legal delivery system, educational institutions, natural resource planning, customer relation management and so on.

In a nutshell:

- Information is needed to survive in the modern competitive world.
- Information is needed to create strong information systems and keep these systems up to date.

Information processing has transformed our society in numerous ways. From a business perspective, there has been a huge shift towards increasingly automated business processes and communication. Access to information and capability of information processing has helped in achieving greater efficiency in accounting and other business processes.

A complete business information system, accomplishes the following functionalities:

- Collection and storage of data.
- Transform these data into business information useful for decision making.
- Provide controls to safeguard data.
- Automate and streamline reporting.

The following list summarizes the five main uses of information by businesses and other organizations:

- **Planning** - At the planning stage, information is the most important ingredient in decision making. Information at planning stage includes that of business resources, assets, liabilities, plants and machineries, properties, suppliers, customers, competitors, market and market dynamics, fiscal policy changes of the Government, emerging technologies, etc.
- **Recording** - Business processing these days involves recording information about each transaction or event. This information collected, stored and updated regularly at the operational level.
- **Controlling** - A business need to set up an information filter, so that only filtered data is presented to the middle and top management. This ensures efficiency at the operational level and effectiveness at the tactical and strategic level.
- **Measuring** - A business measures its performance metrics by collecting and analyzing sales data, cost of manufacturing, and profit earned.
- **Decision-making** - MIS is primarily concerned with managerial decision-making, theory of organizational behavior, and underlying human behavior in organizational context. Decision-making information includes the socio-economic impact of competition, globalization, democratization, and the effects of all these factors on an organizational structure.

In short, this multi-dimensional information evolves from the following logical foundations:

- Operations research and management science
- Theory of organizational behavior
- Computer science:
 - Data and file structure
 - Data theory design and implementation

- Computer networking
- Expert systems and artificial intelligence
- Information theory

Following factors arising as an outcome of information processing help speed up of business events and achieves greater efficiency:

- Directly and immediate linkage to the system
- Faster communication of an order
- Electronic transfer of funds for faster payment
- Electronically solicited pricing (helps in determining the best price)

MIS Need for Information Systems

Managers make decisions. Decision-making generally takes a four-fold path:

- Understanding the need for decision or the opportunity,
- Preparing alternative course of actions,
- Evaluating all alternative course of actions,
- Deciding the right path for implementation.

MIS is an information system that provides information in the form of standardized reports and displays for the managers. MIS is a broad class of information systems designed to provide information needed for effective decision making.

Data and information created from an accounting information system and the reports generated thereon are used to provide accurate, timely and relevant information needed for effective decision making by managers.

Management information systems provide information to support management decision making, with the following goals:

- Pre-specified and preplanned reporting to managers.
- Interactive and ad-hoc support for decision making.
- Critical information for top management.

MIS is of vital importance to any organization, because:

- It emphasizes on the management decision making, not only processing of data generated by business operations.
- It emphasizes on the systems framework that should be used for organizing information systems applications.

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

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

Management information system can thus be analyzed as follows:

Management

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

Information

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

System

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

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

Definition

Management Information System 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.

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

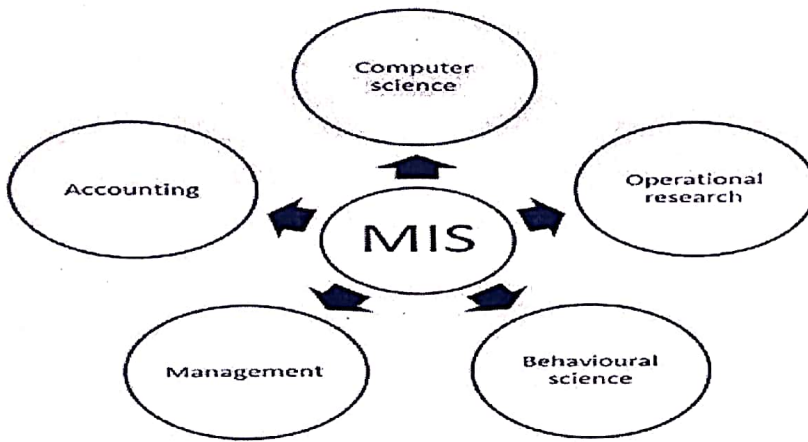
Characteristics of Computerized MIS

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

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

Nature and Scope of MIS

The following diagram shows the nature and scope of MIS:



Role of Information in Decision-making

Information plays a vital role in decision-making. Even to take very simple decisions, we need information. To understand the role played by information in decision-making, we have to understand how decisions are taken. Decision-making is basically a process that includes the following stages:

Information is thus, very important to take decisions.

Imagine a simple decision like the one a driver (say) makes when he puts on the brakes to stop a speeding vehicle when he sees a child crossing the road (in middle of the road). The driver decides on braking based on a lot of information processing that happens in his brain. At every stage of the decision-making he uses information that he captures visually. All decisions are like this.

- ① First we get information about a problem, format it into a structure and then factor in the information about the context in which the problem has occurred. Like in the above case instead of the child being at the middle of the road and crossing it, the driver would have seen the child about to cross over with a few steps only he would probably not have braked to stop but would have slowed down, as he would have calculated that by the time the vehicle reaches the crossing stage, the child would already have passed. So if the problem was structured as 'how to not hit the child crossing the road?', and if the child was at the middle of the road, the driver would have braked but had the child been at (say) at ninety per cent completion level of crossing the road, the driver would have only slowed down and not braked to stop. Therefore, we see that the context has a major role in the decision-making and information is required both about the problem and about the context in which the problem occurred. The next stage for the decision maker would be to generate alternatives. In the driver's case such possible alternatives would be

Stages of Decision-making

Role of Information

Identification and structuring of problem/opportunity

① ^{we} One needs information to identify a problem and put it in a structured manner. Without information about a problem or opportunity, the decision-making process does not even start.

Putting the problem/opportunity in context

② Without information about the context in which the problem has occurred, one cannot take any decision on it. In a way, the information about the context defines the problem.

Generation of alternatives

③ Information is a key ingredient in the generation of alternatives for decision-making. One has to have information about possible solutions to generate alternatives.

Choice of best alternative ✓

Based on the information about the suitability of the alternatives, a choice is made to select the best alternative.

to stop by braking

to slow down

to take a sharp turn towards left or right to avoid the child

press the horn so that the child crosses the road fast

To drive the vehicle on to the footpath and out of the road to avoid collision, etc.

So the decision-maker generates these possible solutions to the problem at hand based on information about such possible solutions. Each of the alternatives represents a possible solution, which one can generate if one has information about them. In the case of the driver, obviously, he needs knowledge and information to generate these alternatives, i.e., to stop by braking the driver would need to know that braking stops the vehicle. If he is unaware of this crucial information he would not have been able to generate this alternative. So information is vital for generation of alternatives. Now for the choice part also, the decision maker needs to have information about the suitability of each alternative to decide, which the 'best' is. In our example, the driver calculates the 'payoff' for each alternative based on his calculation of the outcome that again is based on information. He selects the 'best' option that solves the problem. Thus, we can see that information is the key to the decision making process, without information and the right kind of information decision-making is not possible. Information plays a crucial role in every stage of the decision-making process.

Decision-making is the most important task of managers in an organization. Therefore, to enable managers to take good quality decisions, it is very important to provide them with the right kind of information. Information management in organizations therefore assumes a special significance. In most organizations, business or otherwise, a systematic systems based method is used for information management. Systems based information management works best under a computerized environment and such computer based information management system is normally called 'Management Information Systems (MIS)', which provides the service of information supply to the managers enabling them to take informed decisions. It may be worthwhile to mention here that MIS does not necessitates the use of computer based technology, but the use of computers and information technology makes MIS suitable for business organizations in a competitive environment as it helps to provide timely and accurate information. MIS done manually, without the help of computers is neither timely nor accurate.

Stages of Decision-making	Role of Information
Identification and structuring of problem/opportunity	One needs information to identify a problem and put it in a structured manner. Without information about a problem or opportunity, the decision-making process does not even start.
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(i) A system consists of interacting elements. It is set of inter-related and inter-dependent parts arranged in a manner that produces a unified whole.

(ii) The various sub-systems should be studied in their inter-relationships rather, than in isolation from each other.

(iii) An organisational system has a boundary that determines which parts are internal and which are external.

(iv) A system does not exist in a vacuum. It receives information, material and energy from other systems as inputs. These inputs undergo a transformation process within a system and leave the system as output to other systems.

(v) An organisation is a dynamic system as it is responsive to its environment. It is vulnerable to change in its environment.

In the systems approach, attention is paid towards the overall effectiveness of the system rather than the effectiveness of the sub-systems. The interdependence of the sub-systems is taken into account. The idea of systems can be applied at an organisational level. In Applying system concepts, organisations are taken into account and not only the objectives and performances of different departments (sub-systems).

The systems approach is considered both general and specialised systems. The general systems approach to management is mainly concerned with formal organisations and the concepts are relating to technique of sociology, psychology and philosophy. The specific management system includes the analysis of organisational structure, information, planning and control mechanism and job design, etc.

As discussed earlier, system approach has immense possibilities, "A system view point may provide the impetus to unify management theory. By definitions, it could treat the various approaches such as the process of quantitative and behavioural ones as sub-systems in an overall theory of management. Thus, the systems approach may succeed where the process approach has failed to lead management out of the theory of jungle."

Systems theory is useful to management because it aims at achieving the objectives and it views organisation as an open system. Chester Barnard was the first person to utilize the systems approach in the field of management.

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

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

Management information system can thus be analyzed as follows:

Management

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

Information

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

System

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

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

Definition

Management Information System 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.

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 sub-systems within the organization.
- It should be planned in a top-down way, as the decision makers or the management should actively take part and provide clear direction at the development stage of the MIS.

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

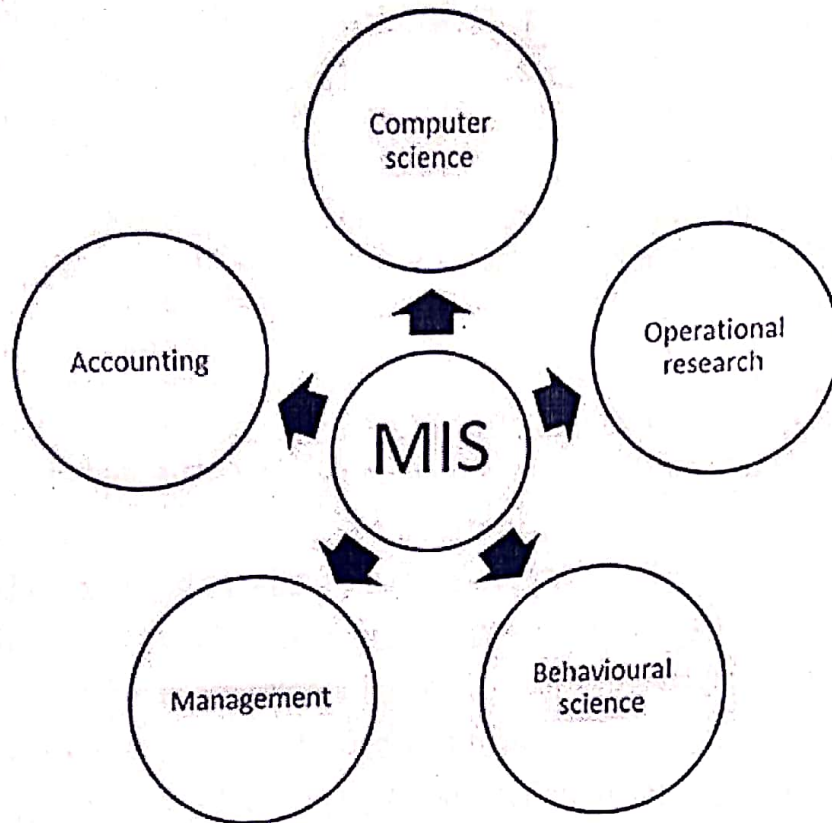
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Nature and Scope of MIS

The following diagram shows the nature and scope of MIS:



What is DSS? What is the purpose of DSS in MIS?

Decision Support System refers to a class of systems which support in the process of decision making and does not always give a decision it self. Decision Support Systems (DSS) are a specific class of computerized information system that supports business and organizational decisionmaking activities.

A properly designed DSS is an interactive softwarebased system intended to help decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions

DSS is an application of Hebert Simon model, as discussed, the model has three phases :

i) Intelligence

ii) Design

iii) Choice

The DSS basically helps in the information system in the intelligence phase where the objective is to identify the problem and then go to the design phase for solution. The choice of selection criteria varies from problem to problem.

It is therefore, required to go through these phases again and again till satisfactory solution is found. In the following three phase cycle, you may use inquiry, analysis, and models and accounting system to come to rational solution.

These systems are helpful where the decision maker calls for complex manipulation of data and use of several methods to reach an acceptable solution using different analysis approach. The decision support system helps in making a decision and also in performance analysis. DSS can be built around the rule in case of programmable decision situation. The rules are not fixed or predetermined and requires every time the user to go through the decision making cycle as indicated in Herbert Simon model.

Attributes :

- i) DSS should be adaptable and flexible.
- ii) DSS should be interactive and provide ease of use.
- iii) Effectiveness balanced with efficiency (benefit must exceed cost).
- iv) Complete control by decision-makers.
- v) Ease of development by (modification to suit needs and changing environment) end users.
- vi) Support modeling and analysis.
- vii) Data access.
- viii) Standalone, integration and Web-based

DSS Characteristics :

- i) Support for decision makers in semi structured and unstructured problems.
- ii) Support managers at all levels.
- iii) Support individuals and groups.
- iv) Support for interdependent or sequential decisions.
- v) Support intelligence, design, choice, and implementation.
- vi) Support variety of decision processes and styles.

Benefits of DSS

- Improves efficiency and speed of decision-making activities.
- Increases the control, competitiveness and capability of futuristic decision-making of the organization.
- Facilitates interpersonal communication.
- Encourages learning or training.
- Since it is mostly used in non-programmed decisions, it reveals new approaches and sets up new evidences for an unusual decision.
- Helps automate managerial processes.

Components of a DSS

Following are the components of the Decision Support System:

- **Database Management System (DBMS):** To solve a problem the necessary data may come from internal or external database. In an organization, internal data are generated by a system such as TPS and MIS. External data come from a variety of sources such as newspapers, online data services, databases (financial, marketing, human resources).
- **Model Management System:** It stores and accesses models that managers use to make decisions. Such models are used for designing manufacturing facility, analyzing the financial health of an organization, forecasting demand of a product or service, etc.

Support Tools: Support tools like online help; pulls down menus, user interfaces, graphical analysis, error correction mechanism, facilitates the user interactions with the system.

Classification of DSS

There are several ways to classify DSS. Hoi Apple and Whinstone classifies DSS as follows:

- **Text Oriented DSS:** It contains textually represented information that could have a bearing on decision. It allows documents to be electronically created, revised and viewed as needed.

- **Database Oriented DSS:** Database plays a major role here; it contains organized and highly structured data.
- **Spreadsheet Oriented DSS:** It contains information in spread sheets that allows create, view, modify procedural knowledge and also instructs the system to execute self-contained instructions. The most popular tool is Excel and Lotus 1-2-3.
- **Solver Oriented DSS:** It is based on a solver, which is an algorithm or procedure written for performing certain calculations and particular program type.
- **Rules Oriented DSS:** It follows certain procedures adopted as rules.
- **Rules Oriented DSS:** Procedures are adopted in rules oriented DSS. Expert system is the example.
- **Compound DSS:** It is built by using two or more of the five structures explained above.

Types of DSS

Following are some typical DSSs:

- **Status Inquiry System:** It helps in taking operational, management level, or middle level management decisions, for example daily schedules of jobs to machines or machines to operators.
- **Data Analysis System:** It needs comparative analysis and makes use of formula or an algorithm, for example cash flow analysis, inventory analysis etc.
- **Information Analysis System:** In this system data is analyzed and the information report is generated. For example, sales analysis, accounts receivable systems, market analysis etc.
- **Accounting System:** It keeps track of accounting and finance related information, for example, final account, accounts receivables, accounts payables, etc. that keep track of the major aspects of the business.
- **Model Based System:** Simulation models or optimization models used for decision-making are used infrequently and creates general guidelines for operation or management.

Types of System:

Different kinds of system may be understood as

Abstract and physical systems

An abstract or conceptual system is an orderly arrangement of interdependent ideas or constructs, which may or may not have any counterpart in the real world.

On the other hand, physical systems are generally concrete operational systems made up of people, materials, machines, energy and other physical things; Physical systems are more than conceptual constructs.

Deterministic and Probabilistic Systems

A deterministic system is one in which the occurrence of all events is known 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.

Open and Closed Systems

An open system is one that interacts with its environment and thus exchanges information, material, or energy with the environment, including random and undefined inputs. Open systems are adaptive in nature, as they tend to react with the environment in such a way, so as to favor their continued existence. Such systems are 'self organizing', in the sense that they change their organisation in response to changing conditions.

A closed system is one, which does not interact with its environment. Such systems in business world, are rare, but relatively closed systems are common. Thus, the systems that are relatively isolated from the environment but not completely closed, are termed closed system.

User Machine Systems

Most of the physical systems are user-machine (or human –machines) systems It is difficult to think of a system composed only of people who do not utilize equipment of some kind to achieve their goals. In user-machine systems, both, i.e. human as well as machine perform some activities in the accomplishment of a goal (e.g. decision-making). The machine elements (may be computer hardware and software) are relatively closed and deterministic, whereas the human elements of the system are open and probabilistic.

The system Approach:

The systems approach is an old concept. The approach stands on the assumption that breaking down of a complex concept into simple easy to understand units helps in better understanding of the complexity. Ludwig von Bertalanffy first proposed the systems approach under the name of 'General System Theory'.

Even though he had orally created the notion of the general systems theory in the 1940's he formally published it in 1968 (Ludwig von Bertalanffy 1968). He introduced system as a new scientific philosophy and defined it in a formal manner. He noted that most systems (biological or physical) of any practical relevance are open as they interact with the environment. Therefore, to understand the system it has to be differentiated from the environment, i.e., the boundary of the system has to be clearly defined along with its interaction with the environment from within this boundary.

The approach concentrates on the holistic entity of the system without neglecting the components. It attempts to understand the role each component plays in the system while simultaneously understanding the activity of the whole system.

Major concepts of the systems approach are:

Holism: A change in any part/component of a system affects the whole system directly or indirectly (Boulding 1985, Litterer 1973, von Bertalanffy 1968).

Specialization: A whole system can be divided into granular (smaller easy to understand), components so that the specialized role of each component is appreciated.

Non-summational: Every component (subsystem/partial system) is of importance to the whole. It is therefore essential to understand the actions of each component to get the holistic perspective (Boulding 1985, Litterer 1973).

Grouping: The process of specialization can create its own complexity by proliferating components with increasing specialization. To avoid this it becomes essential to group related disciplines or sub-disciplines.

Coordination: The grouped components and sub components need coordination. Without coordination the components will not be able to work in a concerted manner and will lead to chaos. Coordination and control is a very important concept in the study of systems as without this we will not be a unified holistic concept.

Emergent properties: This is an important concept of systems approach. It means that the group of interrelated entities (components) has properties as a group that is not present in any individual component. This is the holistic view of a system. For example, multicellular

organisms exhibit characteristics as a whole which are not present in individual constituent parts like cells.

The systems approach to management is a concept that regards an organization as comprising three purposively designed parts that are interconnected: input, process and output. The particular components of these three parts will depend on the nature of your business. Inputs will include raw materials, funds or technology. The process may refer to manufacturing and quality assurance operations in an industrial setting, or activities related to management in the service industry. Outputs will be the products or results of the undertaking. The systems approach principle emphasizes the use of feedback response to aid in correcting or minimizing errors when executing certain operations.

Importance

As an interdisciplinary approach that considers both the business and the technical needs of your customers, the systems approach will ensure quality products that meet user requirements. This is because the approach systematically integrates all functions into an interrelated team effort, providing a structured framework for the development process that proceeds from concept to production. This ensures that all the system functions are optimized to achieve maximum compatibility for enhanced productivity. By leveraging feedback, such as assessment of work done, identification of deviations, and corrective action, changes can be effected to better accomplish the task.

Management is the often unseen force that helps bind an entire organization and helps it to achieve its objectives by conducting the activities of planning, directing, organizing and controlling. In an organization the structure of management conforms to the pattern of a pyramidal structure (in most cases) with a well-defined hierarchy.

This hierarchy in the management with an increasing authority and responsibility as one rises up the pyramid has to be understood before a suitable MIS is designed for the organization. Management deals with organizational functions. Managers are the people who drive an organization by planning for its future, organizing and controlling its present and directing others in the organization to work towards a common objective. However, strictly speaking, in functional terms, management is all about taking decisions. In fact, the only attribute, which distinguishes a manager from the rest of people in the organization, is the manager's ability to take decisions.

However, decision cannot be taken in isolation. Even simple decisions require information as an input. These decision requirements fuel an insatiable need for information within the organization. This information need is met by a set of information systems working in a synchronized manner,

which is collectively called management information system (MIS). The competitive environment of today's business necessitates that the MIS of any modern organization works on an information technology platform and that suitable information is delivered to the right person at the right time. Information systems can be theoretically even manual systems but for all practical purposes³, information systems in today's organizations are based on information technology platforms. Therefore, such information systems are expensive to acquire and maintain. The cost of their failure is even more expensive for the organization as lack of information may cause havoc within the organization. Thus, almost all business organizations have an information technology enabled information system.

Information systems are of different types catering to different user classes. Information systems that cater to the needs of management are the focus in this chapter. These systems are broadly called management information systems if they conform to some specifications. These management information systems can be created from scratch or can be acquired off the shelf and then customized to fit the needs of the organization. Contribution to MIS literature (Anthony 1965) by developing a framework for management information systems in organizations, that remains largely valid. The framework under which management works is also important from the point of view of MIS as MIS is a support function. MIS in an organization is also dependent on the role played by some key personnel like CIO and the system analyst..

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Information Systems: Definition and Characteristics

The role of information in enhancing the competitiveness of an organization has been known in management circles for quite some time now. A former Chairman and CEO of Citicorp, Walter B Wriston commented on information systems and their value to organizations more than two decades back saying,

'Timely information has always conferred power, both in the commercial and in the political marketplace. But as the availability and timeliness of information continues to increase, some of the more traditional sources of power (e.g., natural resources), are declining. Today, management structures are being flattened and sharply reduced by those who really understand the impact of technology on business. The need for layers of management is being reduced everywhere, when information becomes available to more and more people at all levels at a faster rate; One of our leadership tasks is to design ... databases which are important for our own business Anything that enhances the value of a company's data and makes it more available to executives who lack computer skills in general, cannot help but improve the performance of our companies. Corporations may have to develop a formal information strategy, or a formal financial strategy. As all successful companies are market driven, timely access to market information must not only be out in place, but it has to be linked to the internal MIS system.'

According to (Orlikowski 1992), 'Nothing is more central to an organization's effectiveness than its ability to transmit accurate, relevant and understandable information amongst its employees. All of the advantages of an organization's economy of scale, financial and technical resources, diverse talents and contacts are of no practical value if the organization's employees are unaware of what other employees require of them'.

Information systems come a long way. Over the years, their role in the organization has increased and their importance understood and valued by all. They have become sophisticated and now offer a variety of benefits to organizations. They deliver value by enhancing the organization's internal communication channels, extending suitable information to managers to help them take decisions, help in decision-making of top level management by simulating different scenarios, assisting in routine office tasks by automating them, capturing, stores and mapping all transactions between the organization and its internal and external customers. In short, in an organization they are all pervasive and offer tremendous value. This is evident from the enormous investments in information systems by most business organizations. Let us now formally define information systems and its related concepts.

Information System

Information systems are a special class of systems whose main objective is to store, retrieve and process, communicate and secure data. Information systems which help management at different levels to take suitable decisions are called management information systems. Typically information systems are housed in a computerized environment/platform to enable users to get faster and accurate information.

Information systems have themselves had a remarkable transformation in the last forty years of their existence. Initially information systems were designed to perform a specific task. The objective here in this type of system was to perform a task as quickly as possible with the minimum number of errors. The concept of using information systems for taking decisions had not been thought of yet. Organizations used information systems for data processing work only. Be it salary processing or bill processing, information systems of those times were focused on efficiency of operation. The people who worked on these systems had knowledge about the system and the user interface of the systems was very basic (character user interface). The output was in the form of output like salary slips, etc. Processing the data in the most efficient way was the prime focus of such systems. Most of these systems used file based data storage systems on which a computer programme would work, i.e., the computer programme would be able to access the data and organize it but it would store the data in a file. The problem with this type of system was that it led to replication of data and loss of consistency. Most of these system used COBOL computer programming language for such applications. The management of data and records in such files led to the development of important file management concepts like indexing.

Over the years, information systems have changed. Now more focus is on helping the management by providing information useful for decision-making. Data processing systems have become obsolete. Presently, focus is on delivering the right information to the right people at the right time. Information systems have become faster, more accurate and user friendly so that anyone can use it. The people who work on information systems nowadays are not knowledgeable about systems per se. They are normal users. The systems have become so friendly that they do not require users to be specialists in information systems to use them. Newer concepts have emerged in the information systems space to help organizations get better value for their money. Concepts like client server architecture, networking, distributed computing, centralized database, graphical user interface, and Internet have completely changed the information system space. Gone are the bulky mainframe systems requiring loads of money to procure and run. Now more money is required to procure the software than the hardware.

Role of information in Decision making:

Information plays a vital role in decision-making. Even to take very simple decisions, we need information. To understand the role played by information in decision-making, we have to understand how decisions are taken. Decision-making is basically a process that includes the following stages:

Information is thus, very important to take decisions.

Imagine a simple decision like the one a driver (say) makes when he puts on the brakes to stop a speeding vehicle when he sees a child crossing the road (in middle of the road). The driver decides on braking based on a lot of information processing that happens in his brain. At every stage of the decision-making he uses information that he captures visually. All decisions are like this.

First we get information about a problem, format it into a structure and then factor in the information about the context in which the problem has occurred. Like in the above case instead of the child being at the middle of the road and crossing it, the driver would have seen the child about to cross over with a few steps only he would probably not have braked to stop but would have slowed down, as he would have calculated that by the time the vehicle reaches the crossing stage, the child would already have passed. So if the problem was structured as 'how to not hit the child crossing the road?', and if the child was at the middle of the road, the driver would have braked but had the child been at (say) at ninety per cent completion level of crossing the road, the driver would have only slowed down and not braked to stop. Therefore, we see that the context has a major role in the decision-making and information is required both about the problem and about the context in which the problem occurred. The next stage for the decision maker would be to generate alternatives. In the driver's case such possible alternatives would be

Stages of Decision-making	Role of Information
Identification and	One needs information to identify a problem and put it in a structured manner. Without information about a problem or

structuring of problem/opportunity	opportunity, the decision-making process does not even start.
Putting the problem/opportunity in context	Without information about the context in which the problem has occurred, one cannot take any decision on it. In a way, the information about the context defines the problem.
Generation of alternatives	Information is a key ingredient in the generation of alternatives for decision-making. One has to have information about possible solutions to generate alternatives.
Choice of best alternative	Based on the information about the suitability of the alternatives, a choice is made to select the best alternative.

- a. to stop by braking
- b. to slow down
- c. to take a sharp turn towards left or right to avoid the child
- d. press the horn so that the child crosses the road fast
- e. To drive the vehicle on to the footpath and out of the road to avoid collision, etc.

So the decision-maker generates these possible solutions to the problem at hand based on information about such possible solutions. Each of the alternatives represents a possible solution, which one can generate if one has information about them. In the case of the driver, obviously, he needs knowledge and information to generate these alternatives, i.e., to stop by breaking the driver would need to know that *braking stops the vehicle*. If he is unaware of this crucial information he would not have been able to generate this alternative. So information is vital for generation of alternatives. Now for the choice part also, the decision maker needs to have information about the suitability of each alternative to decide, which the 'best' is. In our example, the driver calculates the 'payoff' for each alternative based on his calculation of the outcome that again is based on information. He selects the 'best' option that solves the problem. Thus, we can see that information is the key to the decision making process, without information and the right kind of information decision-making is not possible. Information plays a crucial role in every stage of the decision-making process.

Decision-making is the most important task of managers in an organization. Therefore, to enable managers to take good quality decisions, it is very important to provide them with the right kind of information. Information management in organizations therefore assumes a special significance. In most organizations, business or otherwise, a systematic systems based method is used for information management. Systems based information management works best under a computerized environment and such computer based information management system is normally called 'Management Information Systems (MIS)', which provides the service of information supply to the managers enabling them to take informed decisions. It may be worthwhile to mention here that MIS does not necessitates the use of computer based technology, but the use of computers and information technology makes MIS suitable for business organizations in a competitive environment as it helps to provide timely and accurate information. MIS done manually, without the help of computers is neither timely nor accurate.