UNIT 1
Chapter-1
Introduction to MIS

Ques. What is MIS? Discuss in detail?
OR
Describe the three words of MIS: Management, Information, System.
OR
Discuss the objectives and characteristics of MIS.

Ans.: Management Information Systems (MIS), referred to as Information Management and Systems, is the discipline covering the application of people, technologies, and procedures collectively called information systems, to solving business problems.
"'MIS' is a planned system of collecting, storing and disseminating data in the form of information needed to carry out the functions of management."
Academically, the term is commonly used to refer to the group of information management methods tied to the automation or support of human decision making, e.g. Decision Support Systems, Expert Systems, and Executive Information Systems.
Management : Management is art of getting things done through and with the people in formally organized groups. The basic functions performed by a manager in an organization are: Planning, controlling, staffing, organizing, and directing.
Information : Information is considered as valuable component of an organization. Information is data that is processed and is presented in a form which assists decision maker.
System : A system is defined as a set of elements which are joined together to achieve a common objective. The elements are interrelated and interdependent. Thus every system is said to be composed of subsystems. A system has one or multiple inputs, these inputs are processed through a transformation process to convert these input(s) to output.

1.1 MIS DEFINITION:

The Management Information System (MIS) is a concept of the last decade or two. It has been understood and described in a number ways. It is also known as the Information System, the Information and Decision System, the Computer- based information System.
The MIS has more than one definition, some of which are give below.
1. The MIS is defined as a system which provides information support for decision making in the organization.
2. The MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision making function in the organization.
3. The MIS is defined as a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.
4. The MIS is defined as a Computer based Information System.

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

Hence, a major portion of the overheads goes into this kind of unproductive work in the organization. Every individual in an organization is continuously looking for some information which is needed to perform his/her task. Hence, the information is people-oriented and it varies with the nature of the people in the organization.

The difficulty in handling this multiple requirement of the people is due to a couple of reasons. The information is a processed product to fulfill an imprecise need of the people. It takes time to search the data and may require a difficult processing path. It has a time value and unless processed on time and communicated, it has no value. The scope and the quantum of information is individual dependent and it is difficult to conceive the information as a well-defined product for the entire organization. Since the people are instrumental in any business transaction, a human error is possible in conducting the same. Since a human error is difficult to control, the difficulty arises in ensuring a hundred per cent quality assurance of information in terms of completeness, accuracy, validity, timeliness and meeting the decision making needs.

In order to get a better grip on the activity of information processing, it is necessary to have a formal system which should take care of the following points:
- Handling of a voluminous data.
- Confirmation of the validity of data and transaction.
- Complex processing of data and multidimensional analysis.
- Quick search and retrieval.
- Mass storage.
- Communication of the information system to the user on time.
- Fulfilling the changing needs of the information.

The management information system uses computers and communication technology to deal with these points of supreme importance.

1.2 Objectives of MIS :

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

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

3. Storage of Information : MIS stores the processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organization record, for later use.

4. Retrieval of Information : MIS retrieves information from its stores as and when required by various users.

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

1.3 Characteristics of MIS :

1. Systems Approach : The information system follows a systems approach. Systems approach means taking a comprehensive view or a complete look at the interlocking sub-systems that operate within an organization.

2. Management Oriented : Management oriented characteristic of MIS implies that the management actively directs the system development efforts. For planning of MIS, top-down approach should be followed. Top down approach suggests that the system development starts from the determination of management's needs and overall business objective. To ensure that the implementation of system's polices meet the specification of the system, continued review and participation of the manager is necessary.

3. Need Based : MIS design should be as per the information needs of managers at different levels.

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

5. Future Oriented : MIS should not merely provide past of historical information; rather it should provide information, on the basis of future projections on the actions to be initiated.

6. Integrated : Integration is significant because of its ability to produce more meaningful information. Integration means taking a comprehensive view or looking at the complete picture of the interlocking subsystems that operate within the company.

7. Common Data Flow : Common data flow includes avoiding duplication, combining similar functions and simplifying operations wherever possible. The development of common data flow is an economically sound and logical concept, but it must be viewed from a practical angle.

8. Long Term Planning : MIS is developed over relatively long periods. A heavy element of planning should be involved.

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

10. **Central database :** In the MIS there should be common data base for whole system

1.4 ROLE OF THE MANAGEMENT INFORMATION SYSTEM:

The role of the MIS in an organization can be compared to the role of heart in the body. The information is the blood and MIS is the heart. In the body the heart plays the role of supplying pure blood to all the elements of the body including the brain. The heart works faster and supplies more blood when needed. It regulates and controls the incoming impure blood, processes it and sends it to the destination in the quantity needed. It fulfills the needs of blood supply to human body in normal course and also in crisis. The MIS plays exactly the same role in the organization.

(1) The system ensures that an appropriate data is collected from the various sources, processed, and sent further to all the needy destinations. The system is expected to fulfill the information needs of an individual, a group of individuals, the management functionaries: the managers and the top management.

(2) The MIS satisfies the diverse needs through a variety of systems such as Query Systems, Analysis Systems, Modeling Systems and Decision Support Systems the MIS helps in Strategic Planning, Management Control, Operational Control and Transaction Processing.

(3) The MIS helps the clerical personnel in the transaction processing and answers their queries on the data pertaining to the transaction, the status of a particular record and references on a variety of documents. The MIS helps the junior management personnel by providing the operational data for planning, scheduling and control, and helps them further in decision making at the operations level to correct an out of control situation.

(4) The MIS helps the middle management in short them planning, target setting and controlling the business functions. It is supported by the use of the management tools of planning and control. The MIS helps the top management in goal setting, strategic planning and evolving the business plans and their implementation.

(5) The MIS plays the role of information generation, communication, problem identification and helps in the process of decision making. The MIS, therefore, plays a vita role in the management, administration and operations of an organization.

Ques Discuss an Organizational Need for MIS in a Company?

Ans.: To facilitate the management decision making at all levels of company, the MIS must be integrated. MIS units are company wide. MIS is available for the Top management. The top

management of company should play an active role in designing, modifying and maintenance of the total organization wide management information system. Information system and Information technology have become a vital component of any successful business and are regarded as major functional areas just like any other functional area of a business organization like marketing, finance, production and HR. Thus it is important to understand the area of information system just like any other functional area in the business. MIS is important because all businesses have a need for information about the tasks which are to be performed. Information and technology is used as a tool for solving problems and providing opportunities for increasing productivity and quality. Information has always been important but it has never been so available, so current and so overwhelming. Efforts have been made for collection and retrieval of information, However, challenges still remain in the selection analysis and interpretation of the information that will further improve decision making and productivity.

MIS for a Business Organization :

1. **Support the Business Process :** Treats inputs as a request from the customer and outputs as services to customer. Supports current operations and use the system to influence further way of working.
2. **Support Operation of a Business Organization :** MIS supports operations of a business organization by giving timely information, maintenance and enhancement which provides flexibility in the operation of an organizations.
3. **To Support Decision Making :** MIS supports the decision making by employee in their daily operations. MIS also supports managers in decision making to meet the goals and objectives of the organization. Different mathematical models and IT tools are used for the purpose evolving strategies to meet competitive needs.
4. **Strategies for an Organization :** Today each business is running in a competitive market. MIS supports the organization to evolve appropriate strategies for the business to assented in a competitive environment.

Ques Discuss the Prerequisites of an Effective MIS?

Ans.: Essential Requirement of an Effective MIS :
(i) Qualified System and Management Staff : The prerequisite of an effective MIS is that it should be managed by qualified officers. These officers should have a mutual understanding about the roles and responsibilities of each other. be understand clearly the view of their fellow officers. For this, each organization should have two categories of officers :
(a) System and Computer Experts who in addition to their expertise in their subject area , they should also be capable of understanding management concepts to facilitate the understanding of problems asked by concern. They should also be clear about the process of decision making and information requirements for planning.
(**b) Management experts** who should also understand quite-clearly the concepts and operations of a computer. This basic knowledge of computer will be useful will place them in a comfortable position, while working with systems, technicians in designing or other wise, of the information system.
(ii) Futuristic Perspective : An effective MIS should be capable of meeting the future requirements of its executives as well. This capability can be achieved by regular monitoring and updating the MIS.
(iii) Support of Top Management : For a management information system to be effective, it must receive the full support of top management. The Reasons for this are :
(a) Subordinate managers are usually lethargic about activities which do not receive the support of

their superiors.

(b) The resources involved in computer based information system are larger and are growing larger and larger in view of importance gained by management information system.

(iv) Common Database : It is an integrated collection of data and information which is utilized by several information subsystems of an organization. A common database may be defined as a super file which consolidates and integrates data records formerly stored in a separate data file. Such a database can be organized as an integrated collection of data records into a single super file or it can be organized as an integrated collection of several data file.

(v) Control and maintenance of MIS : Control of the MIS means the operation of the system as it was designed to operate. Some times, users develop their own procedures or short cut methods to use the system which reduces its effectiveness.

Ques What do you understand by Information System? Discuss various type of Information.

Ans.: A business has several information systems **:**

(A) Formal Information System

(B) Informal Information System

(C) Computer Based Information System

(a) Formal Information System : It is based on organizational chart represented by the organization.

(b) Informal Information System : It is an employee based system designed to meet personal and vocational needs and to help in the solution of work-related problems. It also funnels information upward through indirect channels. It works within the framework of the business and its stated policies.

(c) Computer Based Information System (CBIS) : This category of information system depends mainly on the computer for handling business application. System analysis develops different types of information system to meet variety of business needs. There is class of system known as collectively as computer based information system. They are categorized in the following 6 classes:

i) Transaction Processing System (TPS)

ii) Management Information System (MIS)

iii)Decision Support System (DSS)

iv)Executive Support System (ESS)

v)Office Automation Systems (OASs), and

vi)Business Expert Systems (BESs)

Figure shows the specific types of information systems that correspond to each organizational level. The organization has executive support systems (ESS) at the strategic level; management information systems (MIS) and decision-support systems (DSS) at the management level; knowledge work systems (KWS) and office systems at the knowledge level; and transaction processing systems (TPS) at the operational level. Systems at each level in turn are specialized to serve each of the major functional areas. Thus, the typical systems found in organizations are designed to assist workers or managers at each level and in the functionsof sales and marketing, manufacturing, finance, accounting, and human resources.

1. Transaction Processing System:

TPS processes transaction and produces reports. It represents the automation of the fundamental, routine processing used to support business operations.It does not provide any information to the user to his/her decision-making. TPS uses data and produces data as shown in the following diagram.

Previously, TPS was known as Management Information System. Prior to computers, data processing was performed manually or with simple machines. The domain of TPS is at the lowest level of the management hierarchy of an organization.

2. Management Information System (MIS)

MIS is an information system, which processes data and converts it into information.A management information system uses TPS for its data inputs. The information generated by the information system may be used for control of operations, strategic and long-range planning. Short-range planning, management control, and other managerial problem solving. It encompasses processing in support of a wide range of organizational functions & management processes. MIS is capable of providing analysis, planning & decision making support. The functional areas of a business may be marketing, production, human resource, finance and accounting.

3. Decision Support System (DSS)

A decision support system (DSS) is an information system application that assists decision-making. DSS tends to be used in planning, analyzing alternatives, and trial and error search for solution. The elements of the decision support system include a database, model base & software. The main application areas of DSS are Production, finance and marketing.
DSS can be differentiated from MIS on the basis of processing the information. MIS processes data to convert it into information. DSS processes information to support the decision making process of a manager.

4. Executive Support System (ESS)

Executive Support System (ESS) is an extension of the management information system, which is a special kind of DSS; An ESS is specially tailored for the use of chief executive of an organization to support his decision-making. It includes various types of decision-making but it is more specific and person oriented.

5. Office Automation Systems (OAS)

Office automation refers to the application of computes and communication technology to office functions.   Office automation systems are meant to improve the productivity of managers at various levels of management of providing secretarial assistance and better communication facilities.
Office activities may be grouped under two classes, namely
i)Activities performed by clerical personnel (clerks, secretaries, typist, etc.,) and
ii)Activities performed by the executives (managers, engineers or other professionals like economist, researches etc.)
In the first category, the following is a list of activities.
a) Typing

b)Mailing

c)Scheduling of meetings and conferences,

d) Calendar keeping, and

e)Retrieving documents

The following is a list of activities in the second category (managerial category)

a)Conferencing.

b)Production of information (messages, memos, reports, etc.) and controlling performance.

6. Business Expert Systems: These systems are one of the main types of knowledge-based information systems. These systems are based on artificial intelligence, and are advanced information systems. A business expert system is a knowledge based information system that uses its knowledge about a specific, complex application area to act as an expert. The main components of an expert system are:

a. Knowledge Base

b. Interface Engine

c. User Interface

Chapter-2
Information

INFORMATION CONCEPTS

The word .information. is used commonly in our day to day working. In MIS, information has a precise meaning and it is different from data. The information has a value in decision making while data does not have. Information brings clarity and creates an intelligent human response in the mind. In MIS a clear distinction is made between data and information. Data is like raw materials while the information is equivalent to the finished goods produced after processing the raw material. Information has certain characteristics. These are: Information

- Improves representation of an entity
- Updates the level of knowledge.
- Has a surprise value.
- Reduces uncertainty.
- Aids in decision making.

The quality of information could be called good or bad depending on the mix of these characteristics. Devis and Olson defines information as a data that has been processed into a form that is meaningful to the recipient and is of real or perceived value in the current or the prospective actions or decisions of the recipient. Data is defined as groups of non-random symbols in the form of text, images or voice representing quantities, actions and objects. Whether an entity is a data or information, it must be transferred through communication from the Source. to the Destination without loss of content. The general model for such communication is given in Fig.

The above model of communication is used in the MIS. The MIS is equivalent to the transmitter which provides information and sends through reports (channel) to the various receivers, which is decoded or interpreted by the receiver at the destination. The poor quality of information due to various factors would create confusion and misunderstanding, which is equivalent to a Noise and a Destortion in the communication model. A good MIS communicates the information without a noise and a distortion to the user.

Information Presentation

Presentation of the information is an art. The data may be collected in the best possible manner and processed analytically, bringing lot of value in the information; however, if it is not presented properly, it may fail to communicate anything of value to the receiver. The degree of communication is affected by the methods of transmission, the manner of information handling and the limitations and constraints of a receiver as the information processor and the organization as the information user.

The methods used for improving communication are summarization and message routing. The concept of summarization is used to provide information which is needed in the form and content. The information can be summarized in a number of ways as shown in Table .

The principle behind summarization is that too much information causes noises and distortions, i.e., confusion, misunderstanding and missing the purpose. The summarization suppresses the noise and the distortions.

Another method of improving the degree of communication is through message routing. The principle here is to distribute information to all those who are accountable for the subsequent actions or decisions in any manner. That is if the information is generated with a certain purpose for

a primary user, then such information may have secondary purposes to some other users in the organization. This is achieved by sending the copies of the reports or documents to all the concerned people or users. The principle of the message routing achieves the spread of information to the appropriate quarters.

Knowledge is a power and an intelligent person in the organization can misuse this power to achieve personal goals undermining the functional and organizational goals. This tendency should be curbed. Further, the decision maker may call for the information on the grounds that, just in case required, he should readily have it. Apart from the misuse of information, it has an impact on the cost of information processing. In order to curb the misuse of information, a control is exercised on the content of information and its distribution.

Bias in information

While choosing the appropriate method of communicating information a care has to be taken to see that is not biased. For example, while using the techniques of classification or filtering the information, it should not happen that certain information gets eliminated or does not get classified. That is, a deliberate bias in covering certain information is to be avoided. This bias enters because people try to block sensitive information which affects them. To overcome this problem, a formal structure of organization should be adopted and the type of information and its receiver should be decided by the top management.

Many a times the data and the information are suppressed but the inferences are informed, with no or little possibility of verification or rethinking. In this case one who draws inferences may have a bias in the process of collection, processing and presentation of data and information. Though the deliberate enforcement of the inference on the receiver avoids a possibility of the multiple inferences, but in this case processor.s bias is forced on the receiver. For example, organizations have departments like Corporate Planning, Market Research, R and D, HRD and so on, which collect the data and analyze it for the company and communicate the inferences. In all these cases personal bias, organizational bias and management bias may be reflected in the entire process of collection processing, and communication inference.

The presentation of the information will generate a bias and may influence the user. For example, if the information is presented in an alphabetical order and if it is lengthy, the first few information entities will get more attention. If the information is presented with a criteria of exception, the choice of exception and deviation from the exception creates a bias by design itself. For a quick grasp, the information is presented in a graphical form. The choice of scale, the graphic size and the colour introduced a bias in the reader.s mind.

The base, which may creep in inadvertently because of the information system design, can be tackled by making the design flexible, so far as reporting is concerned. Allow the manager or the decision maker to choose his classification or filtering criteria, the scope of information, the method of analysis and the presentation of inference. However, somewhere balance needs to be maintained between the flexibility of the design and the cost, and its benefits to the managers. Disregarding the bias in information, it must have certain attributes to increase its utility as shown in Table.

Redundancy is the repetition of the parts or messages in order to circumvent the distortions or the transmission errors. The redundancy, therefore, sometimes is considered as an essential feature to ensure that the information is received and digested. In MIS the redundancy of data and information, therefore, is inevitable on a limited scale. Its use is to be made carefully so that the reports are not crowded with information.

Characteristics of Information :

The parameters of a good quality are difficult to determine, however, the information can be termed

as of a good quality if it meets the norms of impartiality, validity, reliability, consistency and age. The quality of information has another dimension of utility from the user.s point of view. The users being many, this is difficult to control. Therefore, if one can develop information with due regards to these parameters, one can easily control the outgoing quality of the information with the probable exception of the satisfaction at the users end.

Following are the essential characteristic features :

(i) Timeliness : Timeliness means that information must reach the recipients within the prescribed timeframes. For effective decision-making, information must reach the decision-maker at the right time, i.e. recipients must get information when they need it. Delays destroys the value of information. The characteristic of timeliness, to be effective, should also include up-to-date, i.e. current information.

(ii) Accuracy : Information should be accurate. It means that information should be free from mistakes, errors &, clear Accuracy also means that the information is free from bias. Wrong information given to management would result in wrong decisions. As managers decisions are based on the information supplied in MIS reports, all managers need accurate information.

(iii) Relevance : Information is said to be relevant if it answers especially for the recipient what, why, where, when, who and why? In other words, the MIS should serve reports to managers which is useful and the information helps them to make decisions..

(iv) Adequacy : Adequacy means information must be sufficient in quantity, i.e. MIS must provide reports containing information which is required in the deciding processes of decision-making. The report should not give inadequate or for that matter, more than adequate information, which may create a difficult situation for the decision-maker. Whereas inadequacy of information leads to crises, information overload results in chaos.

(v) Completeness : The information which is given to a manager must be complete and should meet all his needs. Incomplete information may result in wrong decisions and thus may prove costly to the organization.

(vi) Explicitness : A report is said to be of good quality if it does not require further analysis by the recipients for decision making.

(Vii) Impartiality: Impartial information contains no bias and has been collected without any distorted view of the situation. The partiality creeps in, if the data is collected with a preconceived view, a prejudice, and a pre-determined objective or a certain motive.

(viii)Validity: The validity of the information relates to the purpose of the information. In other words, it is the answer to the question-dose the information meet the purpose of decision making for which it is being collected? The validity also depends on how the information is used. Since the information and the purpose need not have one to one correspondence, the tendency to use it in a particular situation may make the information invalid. For example, if the quality of the manufactured product is deteriorating and it is decided to select the causes of poor quality, then one must collect all the possible causes which may affect the quality. Quality is a function of the raw material, the process of manufacture, the tools applied, the measures of the quality assessment, the attitude of the people towards the control of quality. However, if the information collected talks only about raw materials and the process of manufacture, then this information is not sufficient and hence it is not valid for all the decisions which are required to control the quality.

(ix) Reliability: It is connected to the representation and the accuracy of what is being described. For example, if the organization collects the information on the product acceptance in the selected market segment, the size of the sample and the method of selection of the sample will decide the reliability. If the sample is small, the information may not give the correct and a complete picture and hence it is not reliable. The reliability is also affected from the right source.

(x)Consistency: The information is termed as inconsistent if it is derived form a data which dose not have a consistent pattern of period. Somewhere, the information must relate to a consistent base or a pattern. For example, you have collected the information on the quantity of production for the last twelve months to fix the production norms. If in this twelve months period, the factory has worked with variable shift production, the production statistics of the twelve months for comparison is

inconsistent due to per shift production. The consistency can be brought in by rationalizing the data to per shift production per month. The regularity in providing the information also helps in assessing the consistency in the information.

(xi)Age: If the information is old, it is not useful today. The currency of the information makes all the difference to the users. If the information is old then it does not meet any characteristics of the information viz., the update of knowledge, the element of surprise and the reduction of uncertainty, and the representation. Maintaining these parameters at a high degree always poses a number of problems. These problems are in the management of the operations, the sources, the data processing and the systems in the organization. A failure to maintain the parameters to a high degree affects the value of the information to the decision maker.

Q.2 What are the different types of Information?

Ans.: Classification of Information : The information can be classified in a number of ways provide to better understanding.

Jhon Dearden of Harvard University classifies information in the following manner :

(1) Action Verses No-Action Information : The information which induces action is called **action information.** 'No stock'report calling a purchase action is an action information. The information which communicates only the status is No-Action Information. The stock balance is **no-action information.**

(2) Recurring Verses No-Recurring Information : The information generated at regular intervals is r**ecurring information.** The monthly sales reports, the stock statement, the trial balance, etc are recurring information. The financial analysis or the report on the market research study is **norecurring** information.

(3) Internal and external information : The information generated through the internal sources of the organization is termed as **Internal Information**, while the information generated through the govt. reports, the industry survey etc., termed as **External Information**, as the sources of the data are outside the organization.

The information can also be classified, in terms of its application :

(i) Planning Information : Certain standard norms and specifications are used in planning of any activity. Hence such information is called the Planning Information. e. g. Time standard, design standard.

(ii) Control Information : Reporting the status of an activity through a feedback mechanism is called the Controlling Information. When such information shows a deviation from the goal or the objective, it will induce a decision or an action leading to control.

(iii) Knowledge Information : A collection of information through the library records and the research studies to build up a knowledge base as an information is known as Knowledge Information.

(iv)Organization Information : When the information is used by everybody in the organization, it is called Organization Information. Employee and payroll Information is used by a number of people in an organization.

(v) Functional/ Operational Information : When the information is used in the operation of a business it is called Functional/Operational Information.

(vi) Database Information : When the information has multiple use and application, it is called as database information. Material specification or supplier information is stored for multiple users.

Q.6 What is the difference between Data Processing and Information Processing?

Ans.: Data Processing : Data Processing is a process that converts data into information or

knowledge. The processing is usually assumed to be automated and running on a computer. Because data are most useful when well-presented and actually informative, data-processing systems are often referred to as information systems to emphasize their practicality. Nevertheless, both terms are roughly synonymous, performing similar conversions; data-processing systems typically manipulate raw data into information, and likewise information systems typically take raw data as input to produce information as output. Data processing is that a business has collected numerous data concerning an aspect of its operations and that this multitude of data must be presented in meaningful, easy-to-access presentations for the managers who must then use that information to increase revenue or to decrease cost. That conversion and presentation of data as information is typically performed by a data-processing application.

Information Processing : Information processing is the change or processing of information in any manner detectable by an observer. Information processing may more specifically be defined in terms by Claude E. Shannon as the conversion of latent information into manifest information. Latent and manifest information is defined through the terms of equivocation, remaining uncertainty, what value the sender has actually chosen, dissipation uncertainty of the sender what the receiver has actually received and transformation saved effort of questioning - equivocation minus dissipation. Practical Information Processing can be described as a cycle, where data which may have no inherent meaning to the observer is converted into information, which does have meaning to the observer.

Q.7 What are the different methods for Data Collection?
Ans.: Methods of Data and Information Collection :
Several methods are available for the collection of data. The choice of method will have an impact on the quality of information. Similarly the design of data collection method also decides the quality of data and information. The methods of data collection and processing become a part of the MIS. The various methods of data collection are explained in Table . An awareness of these methods is essential to the manager. Further, he should also nunderstand the potential problems of bias, currency, and the fact versus the opinion in the various types of methods. The observation, the experiment, the survey and the subjective estimation are the methods chosen for data collection and information about a specific problem, while the remaining methods are chosen to collect data on a routine basis without any particular problem whatsoever.
Following are the methods of data collection **:**
   i) Observation
   ii) Experiment
   iii) Survey
   iv) Subjective Estimation
   v) Transaction Processing
   vi) Purchase from Outside
   vii)Publication
   viii)   Government Agencies

 Methods of Data and Information Collection :
The specific methods analysts use for collecting data about requirements are called fact – finding techniques. These include the interview, questionnaire, record inspections (on – site review) and observation. Analysts usually employ more that one of these techniques to help ensure an accurate and comprehensive investigation.
1)Interview
Analysts use interviews to collect information from individuals or from groups. The respondents are generally current users of the existing system or potential users of the proposed system. In some instances, the respondents may be managers or employees who provide data for the proposed

system or who will be affected by it. Although some analysts prefer the interview to other fact – finding techniques, it is not always the best source of application data. Because of the time required for interviewing, other methods must also be used to gather the information needed to conduct an investigation.

It is important to remember that respondents and analysts converse during an interview – the respondents are not being interrogated. Interviews provide analysts with opportunities for gathering information form respondents who have been chosen for their knowledge of the system under study. This method is frequently the best source of qualitative information (opinions, policies, and subjective descriptions of activities and problems). Other fact finding methods are likely to be more useful for collecting quantitative data (numbers, frequencies, and quantities).

This method of fact – finding can be especially helpful for gathering information from individuals who do not communicate effectively in writing or who may not have the time to complete questionnaires. Interviews allow analysts to discover areas of misunderstanding, unrealistic expectations, and even indications of resistance to the proposed system.

Interviews can be either structured or unstructured:

Unstructured interviews, using a question – and – answer format, are appropriate when analysts want to acquire general information about a system. This format encourages respondents to share their feelings, ideas, and beliefs.

Structured interviews use standardized questions in either an open response or closed – response format. The former allows respondents to answer in their own words; the latter uses a set of prescribed answers.

Each approach has advantages and disadvantages. The success of an interview depends on the skill or the interviewer and on his or her preparation for the interview. Analysts also need to be sensitive to the kinds of difficulties that some respondents create during interviews and know how to deal with potential problems. They need to consider not only the information that is acquired during an interview, but also its significance. It is important to have adequate verification of data through other data collection methods.

2) Questionnaire

The use of questionnaires allows analysts to collect information about various aspects of a system from a large number of persons. The use of standardized question formats can yield more reliable data than other fact – finding techniques, and the wide distribution ensures greater anonymity for respondents, which can lead to more honest responses. However, this method does not allow analysts to observe the expressions or reactions or respondents. In addition, response may be limited, since completing questionnaires may not have high priority among the respondents.

Analysts often use **open – ended questionnaires** to learn about feeling, opinions, and general experiences or to explore a process or problem.

Closed questionnaires control the frame of reference by presenting respondents with specific responses form which to choose. This format is appropriate for electing factual information.

The high cost of developing and distributing questionnaires demands that analysts carefully consider the objective of the questionnaire and determine what structure will be most useful to the study and most easily understood by the respondents. Questionnaires should also be tested and, if necessary, modified before being printed and distributed.

As with interviewees, recipients, of questionnaires would be selected for the information they can provide. The analysts should ensure that the respondents, background and experiences qualify them to answer the questions.

3)Record Review

Many kinds of records and reports can provide analysts with valuable information about organizations and operations. In record reviews, analysts examine information that has been recorded about the system and user. Record inspection can be performed at the beginning of the study, as an introduction, or later in the study, as a basis for comparing, actual operations with the records indicate should be happening.

Records include written policy manuals, regulations and standard operating procedures used by

most organizations and a guide for managers and employees. They do not show what activities are actually occurring, where the decision – making power lies, or how tasks are performed. However, they can help analysts understand the system by familiarizing them with what operations must be supported and with formal relations within the organization.

4) Observation

Observation allows analysts to gain information they cannot obtain by any other fact – finding method. Through observation, analysts can obtain firsthand information about how activities are carried out. This method is most useful when analysts need to actually observe how documents are handled, how processes are carried out, observers know what to look for and how to assess the significance of what they observe.

Ques Explain the level of business activity with reference to information required?

Ans.: While developing an information management strategy within an organization, it is useful to consider informations need at on three levels :

(i) Corporate (Top Level)

(ii)Team, Division, Business Unit (Middle Level)

(iii)Individual (Low Level)

The needs of each of these three levels must be met if a coordinated and effective solution is to be maintained in the long-term.

Failure to address any one of the levels will lead to areas of the business or individuals finding their own solution, which may not fit well within the strategic goals of the organization.

(i) Corporate (Top Level Information) : At the top level corporate information that is useful for the whole organization. This 'global' information is generally well addressed by the corporate intranet. Examples of corporate information include policies and procedures, HR information, online forms, phone directory, etc. Interestingly, there may be a limited amount of truly global information, and it may not deliver the greatest (measurable) business benefits.

(ii) Team, division, business unit (Middle level) : The middle level is perhaps the most important, as it covers all the information shared within teams, divisions, business units, etc. This information may be critical to the day-to-day activities of the group, but of little interest to the rest of the organization. Examples include project documentation, business unit specific content, meeting minutes, etc. This level is generally poorly-served within organizations, although collaboration tools are increasingly being used to address team information needs. It is also being recognized that it is this 'local' information that may be the most valuable, in terms of driving the day-to-day activity of the organization.

(iii) Individual (Low Level) : At the lowest level the personal information need of staff exists throughout the organization. Examples include correspondence, reports and spreadsheets. In most organizations, staff must struggle with using email to meet their information management needs. While staff generally recognizes the inadequacy of e-mail, they have few other approaches or technologies at their disposal.

Managing the Levels : While managing the information at each of the three levels, consider aspects need consideration**:**

(a) An information management solution must be provided for staff at each of the three levels.

If corporate solutions aren't provided, then staff will find their own solutions. This is the source of poor-quality intranet sub-sites, and other undesirable approaches.

(b) A clear policy must be developed, outlining when and how it will apply at all the three levels and how information should be managed at each level.

(c) Processes must be put in place to 'bubble up' or 'promote' information from lower levels to higher levels. For example, some team-generated information will be critical for the whole organization.

(d) As much as possible, a seamless information management environment should be delivered that

covers all the three levels.

Ques What do you mean by Value of Information?

Ans.: Dimensions of Information : There are three most common dimensions of information for MIS **:**
(i) **Economic Dimension :** Economic dimension of information refers to the cost of information and its benefits. Generation of information costs money. Measuring cost and benefit of information is difficult because of intangible characteristic of information.
Cost of Information : Cost of information may include: Cost of acquiring data, Cost of maintaining data, Cost of generating information and Cost of communication information. Cost related to the response time require to generate information and communicating it. Thus, for **system with low response time, the cost is high.** The cost is depends on accuracy, speed of generation etc.

Value of Information : Information has a cost for its acquisition and maintenance. Thus before a particular piece of information is acquired, decision maker must know its value. The information has a perceived value in terms of decision making. The decision maker feels more secured when additional information is received in case of decision making under uncertainty or risk.
Perfect Information : The information is called a **Perfect Information,** if it wipes out uncertainty or risk completely. However, perfect information is a myth. The value of information is the value of the change in decision behavior because of the information. The change in the behaviour due to new information is measured to determine the benefit from its use. To arrive at the value of information, the cost incurred to get this information is deducted from the benefit.
Value of information = Cost to get information-benefit
Given a set of possible decisions, a decision maker will select one on the basis of the available information. If the new information causes a change in the decision, then the value of information is the difference in the value between outcome of the old decision and that of new decision, less the cost obtaining the new information. The value of the additional information making the existing information perfect (VPI) is:
VPI = $(V_2 - V_1) - (C_2 - C_1)$
Where V is the value of the information and C is the cost of obtaining the information. V_1 and C_1 relate to one set of information V_2, C_2 relate to the new set.
In MIS, the concept of the value of information is used to find out the benefit of perfect information and if the value is significantly high, the system should provide it. If the value is insignificant, it would not be worth collecting the additional information.
(ii) **Business Dimension :** Different types of information are required by managers at different levels of the management hierarchy. The information needs of managers at strategic planning level are altogether different that those of operational control managers. It is because of the fact that managers at different levels are required to perform different functions in an organization.
(iii) **Technical Dimension :** This dimension of information refers to the technical aspects of the database. It includes the capacity of database, response time, security, validity, data interrelationship etc.

Unit 2

Chapter 3

DEFINING A SYSTEM
A collection of components that work together to realize some objectives forms a system. Basically there are three major components in every system, namely input, processing and output.
In a system the different components are connected with each other and they are interdependent. For example, human body represents a complete natural system. We are also bound by many national systems such as political system, economic system, educational system and so forth. The objective of the system demands that some output is produced as a result of processing the suitable inputs. A well-designed system also includes an additional element referred to as 'control' that provides a feedback to achieve desired objectives of the system.
Term system is derived from the Greek word 'Systema' which means an organized relationship among functioning units or components.

Definition of System :
"A system is an orderly grouping of interdependent components linked together according to a plan to achieve a specific objective".

Characteristics of a System:
• Organization
 • Interaction
 • Interdependence
 • Integration
 • Central Objective

i) **Organization**-It implies structure and order.
ii) **Interaction-**It refers to manner in which each component functions with other components of the system.
iii)**Interdependence-**Units/parts are dependent on each other.
iv)**Integration-**The parts of a system work together within the system even though each part performs a unique function.
v)**Central Objective-**Objective may be real or stated. All the components work together to achieve that particular objective.

1.5 Elements of a System
 In most cases, systems analysts operate in a dynamic environment where change is a way of life. The environment may be a business firm, a business application, or a computer system. To reconstruct a system, the following key elements must be considered:
1. Outputs and inputs.
2. Processor(s).
3. Control.
4. Feedback.
5. Environment.
6. Boundaries and interface.
 1) **Outputs and Inputs :** A major objective of a system is to produce an output that has value to its user. Whatever the nature of the output (goods, services, or information), it must be in line with the expectations of the intended user. Inputs are the elements (material, human resources, and information) that enter the system for processing. Output is the outcome of processing. A system

feeds on input to produce output in much the same way that a business brings in human, financial, and material resources to produce goods and services. It is important to point out here that determining the output is a first step in specifying the nature, amount, and regularity of the input needed to operate a system. For

example, in systems analysis, the first concern is to determine the user's requirements of a proposed computer system – that is, specification of the output that the computer is expected to provide for meeting user requirements.

2) Processor(s) : The processor is the element of a system that involves the actual transformation of input into output. It is the operational component of a system. Processors may modify the input totally or partially, depending on the specifications of the output. This means that as the output specifications change so does the processing. In some cases, input is also modified to enable the processor to handle the transformation.

3) Control : The control element guides the system. It is the decision – making subsystem that controls the pattern of activities governing input, processing, and output. In an organizational context, management as a decision – making body controls the inflow, handling and outflow of activities that affect the welfare of the business. In a computer system, the operating system and accompanying software influence the behaviour of the system. Output specifications determine what and how much input is needed to keep the system in balance.

In systems analysis, knowing the attitudes of the individual who controls the area for which a computer is being considered can make a difference between the success and failure of the installation. Management support is required for securing control and supporting the objective of the proposed change.

4)Feedback: Control in a dynamic system is achieved by feedback. Feedback measures output against a standard in some form of cybernetic procedure that includes communication and control. Output information is fed back to the input and / or to management (Controller) for deliberation. After the output is compared against performance standards, changes can result in the input or processing and consequently, the output.

Feedback may be positive or negative, routing or informational. Positive feedback reinforces the performance of the system. It is routine in nature. Negative feedback generally provides the controller with information for action. In systems analysis, feedback is important in different ways. During analysis, the user may be told that the problems in a given application verify the initial concerns and justify the need for change.

Another form of feedback comes after the system is implemented. The user informs the analyst about the performance of the new installation. This feedback often results in enhancements to meet the user's requirements.

5) Environment

The environment is the "suprasystem" within which an organization operates. It is the source of external elements that impinge on the system. In fact, it often determines how a system must function. For example, the organization's environment, consisting of vendors, competitors, and others, may provide constraints and, consequently, influence the actual performance of the business.

6) Boundaries and interface

A system should be defined by its boundaries – the limits that identify its components, processes and interrelationship when it interfaces with another system. For example, a teller system in a commercial bank is restricted to the deposits, withdrawals and related activities of customers checking and savings accounts. It may exclude mortgage foreclosures, trust activities, and the like.

Each system has boundaries that determine its sphere of influence and control. For example, in an integrated banking – wide computer system design, a customer who has a mortgage and a checking account with the same bank may write a check through the "teller system" to pay the premium that is later processed by the "mortgage loan system." Recently, system design has been successful in allowing the automatic transfer of funds form a bank account to pay bills and other obligations to creditors, regardless of distance or location. This means that in systems analysis, knowledge of the boundaries of a givensystem is crucial in determining the nature of its interface with other systems

for successful design.

1.6 Types of systems
 The frame of reference within which one views a system is related to the use of
the systems approach for analysis. Systems have been classified in different ways.
Common classifications are: (1) physical or abstract, (2) open or closed, and (3) "man –
made" information systems.

1.6.1 Physical or abstract systems
 Physical systems are tangible entities that may be static or dynamic in operation.
For example, the physical parts of the computer center are the officers, desks, and chairs
that facilitate operation of the computer. They can be seen and counted; they are static. In
contrast, a programmed computer is a dynamic system. Data, programs, output, and
applications change as the user's demands or the priority of the information requested
changes. Abstract systems are conceptual or non-physical entities. They may be as
straightforward as formulas of relationships among sets of variables or models – the
abstract conceptualization of physical situations. A model is a representation of a real or a
planned system. The use of models makes it easier for the analyst to visualize
relationships in the system under study. The objective is to point out the significant
elements and the key interrelationships of a complex system.

1.6.2 Open or Closed Systems
 Another classification of systems is based on their degree of independence. An
open system has many interfaces with its environment. It permits interaction across its
boundary; it receives inputs from and delivers outputs to the outside. An information
system falls into this category, since it must adapt to the changing demands of the user. In
contrast, a closed system is isolated from environmental influences. In reality, a
completely closed system is rare. In systems analysis, organizations, applications and
computers are invariably open, dynamic systems influenced by their environment.

1.4 SYSTEM LIFE CYCLE:

System life cycle is an organizational process of developing and maintaining systems. It helps in
establishing a system project plan, because it gives overall list of processes and sub-processes
required for developing a system.
System development life cycle means combination of various activities. In other words we can say
that various activities put together are referred as system development life cycle. In the System
Analysis and Design terminology, the system development life cycle also means software
development life cycle.
Following are the different phases of system development life cycle:

1. Preliminary study
2. Feasibility study
3. Detailed system study
4. System analysis
5. System design
6. Coding
7. Testing
8. Implementation
9. Maintenance

The different phases of system development life cycle is shown in Fig.below.

1.5 PHASES OF SYSTEM DEVELOPMENT LIFE CYCLE

(1) Preliminary System Study:
Preliminary system study is the first stage of system development life cycle. This is a brief investigation of the system under consideration and gives a clear picture of what actually the physical system is? In practice, the initial system study involves the preparation of a 'System Proposal' which lists the Problem Definition, Objectives of the Study, Terms of reference for Study, Constraints, Expected benefits of the new system, etc. in the light of the user requirements. The system proposal is prepared by the System Analyst (who studies
the system) and places it before the user management. The management may accept the proposal and the cycle proceeds to the next stage. The management may also reject the proposal or request some modifications in the proposal. In summary, we would say that system study phase passes through the following steps:
- problem identification and project initiation
- background analysis
- inference or findings (system proposal)

(2) Feasibility Study:
In case the system proposal is acceptable to the management, thenext phase is to examine the feasibility of the system. The feasibilitystudy is basically the test of the proposed system in the light of itsworkability, meeting user's requirements, effective use of resourceand of course, the cost effectiveness. These are categorized as technical,operational, economic and schedule feasibility. The main goalof feasibility study is not to solve the problem but to achieve thescope. In the process of feasibility study, the cost and benefits are estimated with greater accuracy to find the Return on Investment(ROI). This also defines the resources needed to complete the detailed investigation. The result is a feasibility report submitted tothe management. This may be accepted or accepted with modificationsor rejected. The system cycle proceeds only if the managementaccepts it.

(3) Detailed System Study:
The detailed investigation of the system is carried out in accordancewith the objectives of the proposed system. This involves detailedstudy of various operations performed by a system and their relationshipswithin and outside the system. During this process, dataare collected on the available files, decision points and transactionshandled by the present system. Interviews, on-site observation andquestionnaire are the tools used for detailed system study. Usingthe following steps it becomes easy to draw the exact boundary of the new system under consideration:
- Keeping in view the problems and new requirements
- Workout the pros and cons including new areas of the system

All the data and the findings must be documented in the form of detailed data flow diagrams (DFDs), data dictionary, logical data structures and miniature specification. The main points to be discussed in this stage are:
- Specification of what the new system is to accomplish based on the user requirements.
- Functional hierarchy showing the functions to be performed by the new system and their relationship with each other.
- Functional network, which are similar to function hierarchy but they highlight the functions which are common to more than one procedure.
- List of attributes of the entities – these are the data items which need to be held about each entity (record)

(4) System Analysis:
Systems analysis is a process of collecting factual data, understand the processes involved, identifying problems and recommending feasible suggestions for improving the system functioning.

This involves studying the business processes, gathering operational data, understand the information flow, finding out bottlenecks and evolving solutions for overcoming the weaknesses of the system so as to achieve the organizational goals. System Analysis also includes subdividing of complex process involving the entire system, identification of data store and manual processes. The major objectives of systems analysis are to find answers for each business process: What is being done, How is it being done, Who is doing it, When is he doing it, Why is it being done and How can it be improved? It is more of a thinking process and involves the creative skills of the System Analyst. It attempts to give birth to a new efficient system that satisfies the current needs of the user and has scope for future growth within the organizational constraints. The result of this process is a logical system design. Systems analysis is an iterative process that continues until a preferred and acceptable solution emerges.

(5) System Design:
Based on the user requirements and the detailed analysis of the existing system, the new system must be designed. This is the phase of system designing. It is the most crucial phase in the developments of a system. The logical system design arrived at as a result of systems analysis is converted into physical system design. Normally, the design proceeds in two stages:
- Preliminary or General Design
- Structured or Detailed Design

Preliminary or General Design: In the preliminary or general design, the features of the new system are specified. The costs of implementing these features and the benefits to be derived are estimated. If the project is still considered to be feasible, we move to the detailed design stage.

Structured or Detailed Design: In the detailed design stage, computer oriented work begins in earnest. At this stage, the design of the system becomes more structured. Structure design is a blue print of a computer system solution to a given problem having the same components and inter-relationships among the same components as the original problem. Input, output, databases, forms, codification schemes and processing specifications are drawn up in detail.

In the design stage, the programming language and the hardware and software platform in which the new system will run are also decided.

There are several tools and techniques used for describing the system design of the system. These tools and techniques are:
- Flowchart
- Data flow diagram (DFD)
- Data dictionary
- Structured English
- Decision table
- Decision tree

Each of the above tools for designing will be discussed in detailed in the next lesson. The system design involves:
i. Defining precisely the required system output
ii. Determining the data requirement for producing the output
iii. Determining the medium and format of files and databases
iv. Devising processing methods and use of software to produce output
v. Determine the methods of data capture and data input
vi. Designing Input forms
vii. Designing Codification Schemes
viii. Detailed manual procedures
ix. Documenting the Design

(6) Coding:
The system design needs to be implemented to make it a workable system. This demands the coding of design into computer understandable language, i.e., programming language. This is also called

the programming phase in which the programmer converts the program specifications into computer instructions, which we refer to as programs. It is an important stage where the defined procedures are transformed into control specifications by the help of a computer language. The programs coordinate the data movements and control the entire process in a system. It is generally felt that the programs must be modular in nature. This helps in fast development, maintenance and future changes, if required.

(7) Testing:
Before actually implementing the new system into operation, a test run of the system is done for removing the bugs, if any. It is an important phase of a successful system. After codifying the whole programs of the system, a test plan should be developed and run on a given set of test data. The output of the test run should match the expected results. Sometimes, system testing is considered a part of implementation process. Using the test data following test run are carried out:
  • Program test
  • System test

Program test: When the programs have been coded, compiled and brought to working conditions, they must be individually tested with the prepared test data. Any undesirable happening must be noted and debugged (error corrections)

System Test: After carrying out the program test for each of the programs of the system and errors removed, then system test is done. At this stage the test is done on actual data. The complete system is executed on the actual data. At each stage of the execution, the results or output of the system is analysed.

During the result analysis, it may be found that the outputs are not matching the expected output of the system. In such case, the errors in the particular programs are identified and are fixed and further tested for the expected output. When it is ensured that the system is running error-free, the users are called with their own actual data so that the system could be shown running as per their requirements.

(8) Implementation:
After having the user acceptance of the new system developed, the implementation phase begins. Implementation is the stage of a project during which theory is turned into practice. The major steps involved in this phase are:
  • Acquisition and Installation of Hardware and Software
  • Conversion
  • User Training
  • Documentation

The hardware and the relevant software required for running the system must be made fully operational before implementation. The conversion is also one of the most critical and expensive activities in the system development life cycle. The data from the old system needs to be converted to operate in the new format of the new system. The database needs to be setup with security and recovery procedures fully defined.

During this phase, all the programs of the system are loaded onto the user's computer. After loading the system, training of the user starts. Main topics of such type of training are:
  • How to execute the package
  • How to enter the data
  • How to process the data (processing details)
  • How to take out the reports

After the users are trained about the computerized system, working has to shift from manual to computerized working. The process is called 'Changeover'. The following strategies are followed for changeover of the system.

(i) Direct Changeover: This is the complete replacement of the old system by the new system. It is a risky approach and requires

comprehensive system testing and training.

(ii) Parallel run: In parallel run both the systems, i.e., computerized and manual, are executed simultaneously for certain defined period. The same data is processed by both the systems. This strategy is less risky but more expensive because of the following:

- Manual results can be compared with the results of the computerized system.
- The operational work is doubled.
- Failure of the computerized system at the early stage does not affect the working of the organization, because the manual system continues to work, as it used to do.

(iii) Pilot run: In this type of run, the new system is run with the data from one or more of the previous periods for the whole or part of the system. The results are compared with the old system results. It is less expensive and risky than parallel run approach. This strategy builds the confidence and the errors are traced easily without affecting the operations.

The documentation of the system is also one of the most important activity in the system development life cycle. This ensures the continuity of the system. There are generally two types of documentation prepared for any system. These are:

- User or Operator Documentation
- System Documentation

The user documentation is a complete description of the system from the users point of view detailing how to use or operate the system. It also includes the major error messages likely to be encountered by the users. The system documentation contains the details of system design, programs, their coding, system flow, data dictionary, process description, etc. This helps to understand the system and permit changes to be made in the existing system to satisfy new user needs.

(9) Maintenance:

Maintenance is necessary to eliminate errors in the system during its working life and to tune the system to any variations in its working environments. It has been seen that there are always some errors found in the systems that must be noted and corrected. It also means the review of the system from time to time. The review of the system is done for:

- ⎷ knowing the full capabilities of the system
- ⎷ knowing the required changes or the additional requirements
- ⎷ studying the performance.

If a major change to a system is needed, a new project may have to be set up to carry out the change. The new project will then proceed through all the above life cycle phases.

Types of System

1. **• Physical or Abstract System**

• Physical – These are tangible entities that may be static or dynamic in operation.
For example- parts of a computer center are the desks, chairs etc. that facilitate
operation of the computer. They are static and a programmed computer is dynamic.
 Continued…
• Abstract System – These are conceptual or non physical entities. For example- the
abstract conceptualization of physical situations. A model is a representation of a
real or planned system. A model is used to visualize relationships.

2. **Deterministic or Probabilistic** System

• Deterministic System – It operates in a predictable manner and the interaction between
parts is known with certainty. For example: Two molecules of hydrogen and one molecule of
oxygen makes water.

• Probabilistic System – It shows probable behavior. The exact output is not known. For example: weather forecasting, mail delivery.

3. Social, Human Machine, Machine System

• Social System- It is made up of people. For example: social clubs, societies
• Human Machine System- When both human and machines are involved to perform a particular a particular task to achieve a target. For example:- Computer.
• Machine System- Where human interference is neglected. All the tasks are performed by the machine. Natural and Manufactured
• Natural System- The system which is natural. For example- Solar system, Seasonal System.
• Manufactured System- System made by man is called manufactured system. For example- Rockets, Dams, Trains. Permanent or Temporary System
• Permanent System- Which persists for long time. For example- policies of business.
• Temporary System- Made for specified time and after that they are dissolved. For example- setting up DJ system.

4. Adaptive and Non Adaptive System

• Adaptive System- respond to change in the environment in such a way to improve their performance and to survive. For example- Human beings, animals.

• Non Adaptive System-The system which doesn't respond to the environment. For example- Machines Continued…
• Open System – It has many interfaces with its environment. It interacts across its boundaries, it receives inputs from and delivers outputs to the outside world. It must adapt to the changing demands of the user.
• Closed System – It is isolated from the environmental influences. A completely closed system is rare.

Characteristics of Open Systems

• Input from outside- Open systems are self adjusting and self regulating. When functioning properly open system reaches a steady state or equilibrium.
• Entropy- Dynamic systems run down over time resulting in loss of energy or entropy. Open systems resist entropy by seeking new input or modifying the processes to return to a steady state.
• Process, output and cycles- Open system produce useful output and operate in cycles, following a continuous flow path.
• Differentiation- They have a tendency toward an increasing specialization of functions and a greater differentiation of their components. For example the role of machines and people tend toward greater specialization and greater interaction.
• Equifinality- Goals are achieved through differing courses of action and a variety of paths.

5. Man Made Information Systems

• Information System may be defined as a set of devices, procedures, and operating systems designed around user based criteria to produce information and communicate it to the user for planning, control and performance.

Formal Information Systems

• It is based on the organization represented by organization chart.
• The chart is a map of positions and their authority relationships, indicated by boxes and connected by straight lines.

Categories of Information

• Strategic Information- relates to ling range planning policies that are direct interest to upper management and for long range goals. For example- population growth, trends in financial investment, human resources.

• This information is achieved with the aid of DSS.

• Managerial Information- It is of direct use to middle management and department heads for implementation and control. For example- sales analysis, cash flow projections, and annual financial statements.

• This information is of use in short and intermediate range planning- i.e. months rather than years.

• It is maintained with the help of MIS.

• Operational Information- It is short term, daily information used to operate departments and to enforce the day to day rules and regulations of the business. For example- daily employee absence sheets, overdue purchase orders, current stock.

• It is established by data processing systems. Informal Information Systems

• It is an employee based system designed to meet personnel and vocational needs and to help solve, work related problems.

Computer Based Information System

• It relies on computer for handling business applications.