

Biyani's Think Tank

Concept based notes

Management Information Systems

M.Sc. IT

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Preface

I am glad to present this book, especially designed to serve the needs of the students. The book has been written keeping in mind the general weakness in understanding the fundamental concepts of the topics. The book is self-explanatory and adopts the “Teach Yourself” style. It is based on question-answer pattern. The language of book is quite easy and understandable based on scientific approach.

This book covers basic concepts related to the microbial understandings about diversity, structure, economic aspects, bacterial and viral reproduction etc.

Any further improvement in the contents of the book by making corrections, omission and inclusion is keen to be achieved based on suggestions from the readers for which the author shall be obliged.

I acknowledge special thanks to Mr. Rajeev Biyani, *Chairman* & Dr. Sanjay Biyani, *Director (Acad.)* Biyani Group of Colleges, who are the backbones and main concept provider and also have been constant source of motivation throughout this Endeavour. They played an active role in coordinating the various stages of this Endeavour and spearheaded the publishing work.

I look forward to receiving valuable suggestions from professors of various educational institutions, other faculty members and students for improvement of the quality of the book. The reader may feel free to send in their comments and suggestions to the under mentioned address.

Author

Syllabus

M.Sc. IT

Management Information Systems

Section A : Introduction to System and Basic System Concepts, Types of Systems, The Systems Approach, Information System : Definition & Characteristics, Types of Information, Role of Information in Decision-Making, Sub-Systems of an Information System : EDP and MIS Management Levels, EDP/MIS/DSS

Section B : An Overview of Management Information System : Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS : Information requirements & Levels of Management, Simon's Model of Decision-Making, Structured Vs Un-structured Decisions, Formal Vs. Informal Systems.

Section C : Developing Information Systems : Analysis & Design of Information Systems : Implementation & Evaluation, Pitfalls in MIS Development.

Section D : Functional MIS : A Study of Marketing, Personnel, Financial and Production MIS.

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Chapter-1

Introduction to MIS

Q.1 What do you understand by System? Discuss the types and characteristics of System?

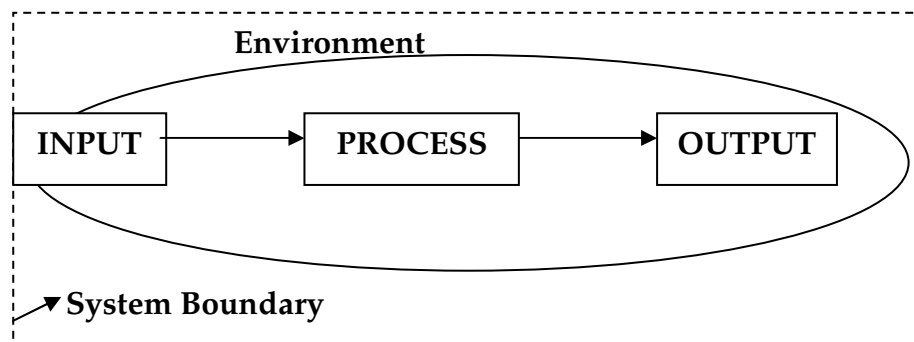
Ans.: The word system is derived from the Greek word “system” which means a organized relationship among the following unit or component.

“A system is an orderly grouping of interdependent components linked together according to a plan to achieve a specific goal.”

The word component may refer to physical parts (engine, wheels of cars), management steps (planning, organizing, controlling) or a sub subsystem in a multi level structure. It is to be noted that a system is not a randomly arranged set. It is arranged with some logic governed by rules, regulation, principles and policies.

In MIS we are usually concerned with man-made system involving input, process and output, as represented in figure. A system may have multiple inputs and multiple outputs.

All systems operate in an environment. The environment may influence the system in its design and performance. When a system is designed to achieve certain objective, it automatically sets the boundaries for itself. The understanding of boundaries of the system is essential to bring clarity in explaining the system components and their arrangement.



A typical system

Characteristics of System :

Following characteristics are present in all systems :

- a) Organization
- b) Interaction
- c) Interdependence
- d) Integration
- e) Central Objective

Organization : Organization implies structure and order. It is the arrangement of components that helps to achieve objectives. Hierarchical relationship starting with the president on top and leading down ward to the blue collar worker represent the organization structure

Interaction : Interaction refers to the procedure in which each component interact with other components of the system. In an organization, for example purchasing must interact with product, advertising with sales and payroll with personnel.

Interdependence : Independence is concerned with how a system is tied together; it is more than sharing a physical part or location. It means that parts of the system part or location with in the system, even through each part performance. A unique function successful integration will typically produce a better request as whole rather than if each component works independently.

Central Objective : Objective may be real or stated. Objective is determined by higher management and user must be aware about the central objective well in advance.

Q.2 Discuss the different types of System?

Ans.: Types of System :

Physical or Abstract : Physical system is tangible entities that may be static or dynamic in nature. Abstract system is conceptual or non-physical. The abstract is conceptualization of physical situations.

Open and Closed : An open system continually interacts with its environment. It receives input from the outside and delivers output to outside. A closed system is isolated from environment influences.

Sub System and Super System : Each system is part of a large system. The business firm is viewed as the system or total system when focus is on production, distribution of goal and sources of profit and income. The total system consists of all the objects, attributes and relationship necessary to accomplish an objective given a number of constraints.

Sub systems are the smaller systems within a system. Super system denotes extremely large and complex system

Permanent and Temporary System : A permanent system is a system enduring for a time span that is long relative to the operation of human. Temporary system is one having a short time span.

Natural and Man Made System : System which is made by man is called man made system. Systems which are in the environment made by nature are called natural system.

Deterministic and Probabilistic : A Deterministic system is one in which the occurrence of all events is perfectly predictable. If we get the description of the system state at a particular time, the next state can be easily predicted.

Probabilistic system is one in which the occurrence of events cannot be perfectly predicted.

Man-made Information System : It is generally believed that the information reduces uncertainty about a state or event. An information system is the basis for interaction between the user and the analyst. It determines the nature of relationship among decision makers.

An information system may be defined as a set of devices, procedures and operating system designed around user-base criteria to produce information and communicating it to the user for planning control and performance.

Q.3 Discuss the major types of Information System?

Ans.: A business has several information systems :

- a) Formal Information System
- b) Informal Information System
- c) Computer Based Information System

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

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.

Computer Based Information System (CBIS) : This category of information system depends mainly on the computer for handling business applications. System analyst develops different types of information systems to meet variety of business needs. There is a class of system collectively known as computer based information system. They can be classified as

- Transaction Processing System (TPS)
- Management Information System(MIS)
- Decision Support System (DSS)
- Office Automation System (OAS)

Transaction Processing System (TPS) : The most fundamental computer based system in an organization pertains to the processing of business transactions. A transaction processing system can be defined as a system that captures, classifies, stores, maintains, updates and retrieves transaction data for record keeping and input to the other types of CBIS. Transaction Processing System is aimed at improving the routine business activities. A transaction is any event or activity that affects the whole organization. Placing order, billing customers, hiring of employees and depositing cheques are some of the common transactions. Types of transactions that occur vary from organization to organization but this is true that all organizations process transaction as a major part of their daily business activities. Transaction Processing System provides speed and accuracy and can be programmed to follow routines without any variance.

Management Information System (MIS) : Data processing by computers has been extremely effective because of several reasons. The main reason is that huge amount of data relating to accounts and other transactions can be processed very quickly. MIS are more concerned with levels of management with information essential to the running of smooth business. This Information must be as relevant, timely, accurate, complete and concise as is economically feasible.

Decision Support System (DSS) : It is an information system that offers the kind of information that may not be predictable. Business professionals may need such information only once. These systems do not produce regularly scheduled management reports. Instead, they are designed to respond to wide range of requests. It is true that all the decisions in an organization are not of a recurring nature. Decision support systems assist managers, who make decisions that are not highly structured, often called unstructured or semi structured decision. The decision support systems support, but do not replace, judgments of managers.

Office Automation System (OAS) : Office Automation Systems are among the newest and most rapidly expanding computer based information systems. They

are being developed with the hope and expectation that they will increase the efficiency and productivity of office workers, typists, secretaries, administrative assistants, staff professionals, managers and others.

Q.4 What do you understand by Information? What are the characteristics of Information?

Ans.: Data : Data is raw facts. Data is like raw material. Data does not interrelate and also it does not help in decision making. Data is defined as groups of non-random symbols in the form of text, images, voice representing quantities, action and objects.

Information : Information is the product of data processing. Information is interrelated data. Information is equivalent to finished goods produced after processing the raw material. The information has a value in decision making. Information brings clarity and creates an intelligent human response in the mind.

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 Generation

It is a most critical resource of the organization. Managing the information means managing future. Information is knowledge that one derives from facts placed in the right context with the purpose of reducing uncertainty.

Characteristics of Information :

The parameters of a good quality are difficult to determine for information.

Quality of information refers to its fitness for use, or its reliability.

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.

Q.5 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 :

- Corporate (Top Level)
- Team, Division, Business Unit (Middle Level)
- 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.

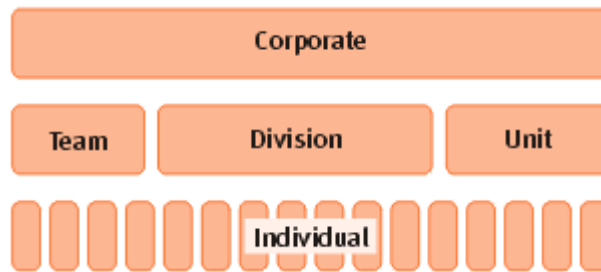
Failure to address any one of the levels will lead to areas of the business or individuals finding their own solution, which may not fit well within the strategic goals of the organization.

Corporate (Top Level Information) : At the top level corporate informations 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.

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 the 'local' information that may be the most valuable, in terms of driving the day-to-day activity of the organization.

Levels of Informations Need



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 e-mail 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:

- 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.

- 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.
- 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.
- As much as possible, a seamless information management environment should be delivered that covers all the three levels.

Q.6 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

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

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.

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- Transaction Processing System (TPS)
- Management Information System(MIS)
- Decision Making System (DSS)
- Office Automation System (OAS)

Q.7 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.

$$\text{Value of information} = \text{Cost to get information-benefit}$$

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:

$$\text{VPI} = (V_2 - V_1) - (C_2 - C_1)$$

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 than 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.

Q.8 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.9 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.

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

Q.10 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 **Recurring 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 **no-recurring** 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 :

- **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.
- **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.
- **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**.
- **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.
- **Functional/ Operational Information** : When the information is used in the operation of a business it is called **Functional/ Operational Information**.
- **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.11 What are the different Sub-System of MIS?

Ans.: The system approach applies equally to management information system as well. The management information system receives input form various internal and external sources. These inputs are processes through the MIS to produce the desired output, which may be in turn used for different managerial task within the organization. MIS has several subsystems which are interdependent, interrelated and interacting.

The Sub-Systems within the MIS are :

Computer System : The computer system as a subsystem of MIS includes the Hardware, the operating system and the software.

Management : The management system as a subsystem of MIS includes the managerial task relating to the effective functioning. It includes planning, control and co-ordination, human resource development etc.

System Engineering : The system engineering subsystem of MIS includes system design and development as well as system maintenance. The synergistic combination of hardware and system engineering is evolved into software engineering. Software engineering as defined by Fritz Baucer, as the

establishment and use of engineering principals in order to obtain economically feasible software that is reliable and works efficiently on real machines.

Application : The application subsystem of MIS includes various application system, which are developed and implemented to the desire outputs.

This process of integration of business system with management information system involves three key elements. They are :

- a) Technology
- b) People
- c) Business

Technology : Technology provides the bridge between the business systems, their information needs on one side, the means of providing these information needs on the other. Technology provides the tools and techniques that help to generate the information that are required for the business system. Selection of the appropriate technology has got bearing on effectiveness of the bridge.

People : People generate the required information and apply the same for business planning, control and decision making. The attitude and aspiration of the people involved in generating and utilizing the information has a bearing on effective use of integrated system.

Business : The business function and the environment in which the business organization have an impact on the entire integration exercise.

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Chapter-2

Overview of MIS

Q.1 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 for 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.

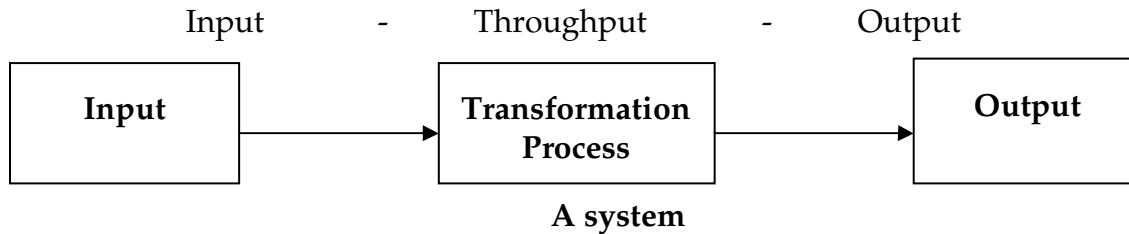


Information Generation

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.

These subsystems are interrelated through a process of



Objectives of MIS :

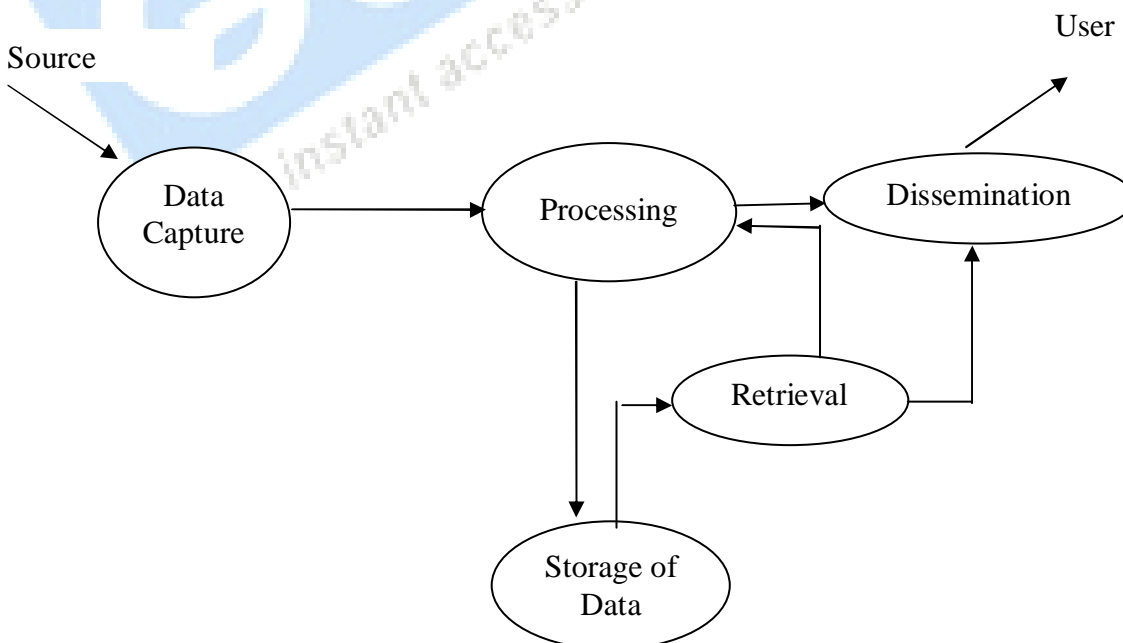
Data Capturing : MIS capture data from various internal and external sources of organization. Data capturing may be manual or through computer terminals.

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.

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

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

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



Objectives of MIS

Characteristics of MIS :

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.

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 policies meet the specification of the system, continued review and participation of the manager is necessary.

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

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.

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.

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.

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.

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

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.

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

Q.2 Highlight the Salient Features of Computer which makes it an essential component of MIS

OR

With the Penetration of Computer in Business Society, Information System has got a new meaning, explain.

Ans.: Characteristics of Computerized MIS :

- (i) Ability to process data into information with accuracy and high speed. It involves complex computation, analysis, comparisons and summarization.
- (ii) Organizing and updating of huge amount of raw data of related and unrelated nature, derived from internal and external sources at different periods of time.
- (iii) The information processing and computer technology have been so advanced that managers are able to obtain real time information about ongoing activities and events without any waiting period.
- (iv) The input data in computer can be converted into different output formats for a variety of purpose. The system is so organized that managers at different levels and in different activity units are in a position to obtain information in whatever form they want, provided that relevant “programms” or instructions have been designed for the purpose.
- (v) Super-human memory, tremendous volume of data and information and the set of instructions can be stored in the computer and can be retrieved as and when needed. Management can get bit of stored information from the computer in seconds.

Advantages of Computer : The usage of computer gives following advantages in comparison to manual MIS :

- a) **Speed :** The speed of carrying out the given instructions logically and numerically is incomparable between computers and human beings. A computer can perform and give instructions in less than a millionth of second
- b) **Accuracy :** Computer can calculate very accurately without any errors.
- c) **Reliability :** The information stored in the computer is in digital format. The information can be stored for a long time and have long life. A user may feel comfortable and be rely on, while using information stored in computer.
- d) **Storage :** Computer can store huge data for a long time in comparison to human brain.

- e) **Automaticity** : Computers perform work automatically through user friendly and menu driven program.
- f) **Repetitiveness** : Computer can be used repetitively to process information without any mental fatigue as in case of human brain.
- g) **Diligence** : A computer is an electronic device. It does not suffer from the human traits of lack of concentration.
- h) **No Feeling** : Computers are devoid of any emotions. They have no feelings and no instincts because they are machines.

Limitations of Computer :

- a) **Lack of Common Sense** : Computer is only an electronic device. It can not think. If we provide an incorrect data, it does not have a commonsense to question the correctness of the data.
- b) **Memory Without Brain** : Computer can store data in its memory; however, if a wrong instruction is given to computer it does not have a brain to correct the wrong instruction.

Q.3 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 :

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.

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.

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.

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.

Q.4 Factors responsible for Development of MIS?

Ans.: Factors Responsible for the development of MIS are numerous and have been a prime concern for many Researchers and Practitioners. Both Inter and external factors must be taken into account when trying to understand and organization's criteria for deciding about technology. The following are the factors which are responsible for development of MIS :

1. External
2. Internal

External Factors : External Factors are conditions that exist in organization's external environment. The factors can be found at the industry level or in national policies.

- (a) **Industry level :** At the industry level, we are looking at characteristics as degree of diffusion of certain technologies, the availability of external know-how, for example, technology suppliers, the degree of innovativeness of the industry, the requirements imposed by major customers and external markets and overall levels of competition and technology sophistication in the industry.
- (b) **National Policies :** For the external factors the national policies also affect the organization that indirectly affects the subsystems of the organization.

Internal Factors : Internal factors internal of the firm that may affect the development of MIS can be grouped into three categories:

- i) **Past Experience with Technology** : The organizations past experience about the technology in terms of exposure and organizational learning ultimately affects its future in developing technology.
- ii) **Organizational Characteristics** : An organization's characteristic like size, influence the adoption of MIS application in organization. The adoption of certain technologies may appear more appropriate for the larger firms because of the large capital investments and the skilled human resources involve in the implementation and operation of such technologies. Smaller firms are less affected by organizational inertia and they show a greater degree of involvement of organizational member's especially top management during implementation. Ready to use software and less expensive equipments of MIS application are more attractive to smaller firms.
- iii) **Organizational Pursued strategy** : Internal factors deal with the organizations pursued strategy on both orientation and technology policy. An organization's strategy reflects its action with market and technology, which ultimately modify its experience and consequently its overall characteristics and capabilities. The need for a strong technology has been advocated by a number of authors and investments in MIS should therefore be closely aligned with overall corporate strategy.

Other Factors :

Customer Satisfaction : Development of MIS is affected by customer satisfaction. Customer of the services should be satisfied by the presented system.

Effective : Development should be effective in terms of organizational benefit & user satisfaction.

Efficient : Development should use all the resources, organization values efficiently.

Q.5 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 and 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.

Q.6 What do you understand by Decision Making? Discuss the nature and characteristics of Decision?

Ans.: The word “**decision** “is derived from the Latin word “**decido**”. Which means “A decision, therefore is

- A Settlement
- A fixed intuition to bringing to a conclusive result
- A judgment
- A resolution

Decision : A decision is the choice out of several options made by the decision maker to achieve some objective in a given situation.

Business Decision : Business decisions are those which are made in the process of conducting business to achieve its objective in a given situation.

Characteristic of Business Decision Making :

- a) Sequential in nature.
- b) Exceedingly complex due to risk and trade off.
- c) Influenced by personal values.
- d) Made in institutional setting and business environment.

Rational Decision Making : A rational decision is the one which, effectively and efficiently, ensure the achievement of the goal for which the decision is made .In reality there is no right or wrong decision but a rational decision or irrational decision which depends on situation.

Type of Rationality :

Objectively : Maximum the value of the objectives.

Subjective : If it is minimize the attainment of value in relation to the knowledge and awareness of subject.

Consciously : Extent the process of the decision making is a conscious one

Organizationally : degree of the orientation towards the organization.

Personal: Rational to the extent is achieve's an individual's personal reason (goals).

Type of Decision Making System : There are two types of decision making system on the basis of knowledge about the environment.

- (i) **Closed :** If the manager operates in a known environment then it is called closed decision making system.

Conditions :

- a) Manager knows the set of decision alternative and know their outcome in term of values.
- b) Manager has a model, by which decision alternatives can be generated, tested and ranked.
- c) The manager can choose one of them, based on some goal or objective.

- (ii) **Open :** If the manager operates in unknown environment then it is called open decision making.

Conditions :

- a) Manager does not know all alternatives.
- b) Outcome is not known.
- c) No methods or models are used.
- d) Decide objective or goal; select one where his aspirates or desire are met best.

Types of Decision : Types of decision are based on the degree of knowledge about the out come of the events which are yet to take place.

Certainty : If the manager has full knowledge of event or outcome then it is a situation of certainty.

Risk : If the manager has partial knowledge or probabilistic knowledge then it is decision under risk.

Uncertainty : If the manager does not have any knowledge, it is decision making under uncertainty

MIS converts the uncertainty to risk and risk to certainty. The decision at the low level management is certain, at middle level of the management the decision is under risk and at the top level management the decision is in under uncertain.

Nature of decision : Decision making is a complex task. To resolve the complexity the nature of decision are of two types :

Programmed and Non-Programmed Decision :

- a) If a decision can be based on a rule, methods or even guidelines, it is called the programmed decision.
- b) A decision which can not be made by using a rule or model is the non-programmed decision.

Q.7 What is DSS? What is the purpose of Decision Support System in MIS.

Ans.: 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 decision-making activities. A properly designed DSS is an interactive software-based 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.

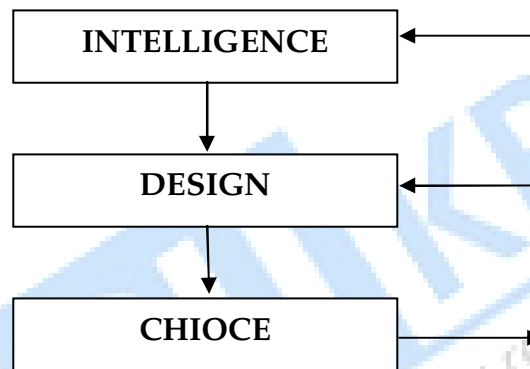
- v) Support intelligence, design, choice, and implementation.
- vi) Support variety of decision processes and styles

Q.8 Discuss in brief the Hebert A. Simon 'Decision Support System Model'. Define the term Intelligence, Design and Choice as Model.

OR

Discuss the essential steps in process of decision making.

Ans.: There are three phases in Hebert Simon model :



Hebert Simon Model

Intelligence : In this phase MIS collects the raw data. Further the data is sorted and merged with other data and computation are made, examined and presented. In this phase, the attention of the manager is drawn to the entire problem situation, calling for a decision.

Design : Manager develops a model of problem situation on which he can generate and test, summarizing the different decision alternatives and test the feasibility of implementation. Assess the value of the decision outcome.

Choice : In this phase the manager evolves a selection criterion and selects one alternative as decision based on selection criteria.

In these three phases if the manager fails to reach a decision, he starts the process all over again from intelligence phase where additional data and information is collected, the decision making process is refined, the selection criteria is changed and a decision is arrived at.

Q.9 What is MIS Planning? Discuss the need and objectives of MIS Planning.

OR

What are the objectives and need of MIS Planning?

Ans.: The plan for development and its implementation is a basic necessity for MIS. In MIS the information is recognized as major resource like capital and time. If this resource has to be managed well, it calls upon the management to plan for it and control it, so that the information becomes a vital resource for the system. The management information system needs good planning. This system should deal with the management information not with data processing alone. It should provide support for the management planning, decision making and action. It should provide support to the changing needs of business management.

A long range MIS plan provides direction for the development of the system and provides a basis for achieving the specific targets or tasks against time frame.

Following are the contents of MIS planning :

MIS Goals and Objectives : It is necessary to develop the goal and objectives for the MIS which will support the business goals. The MIS goals and objectives will consider management philosophy, policy constraints, Business risk, internal and external environment of the organization and business. The goals and objectives of the MIS would be so stated that they can be measured. The typical statements of the goals can be providing online information on the stock and market; the query processing should not exceed more than three seconds and the like.

Strategy for Plan Achievement : The designer has to take a number of strategic decisions for the achievement of MIS goals and objectives. They are

- d) **Development Strategy :** Ex. an online, batch , a real time.
- e) **System Development Strategy :** Designer selects an approach to system development like operational verses functional, accounting verses analysis.
- f) **Resources for the Development :** Designer has to select resources. Resources can be in-house verses external, customized or use of package.
- g) **Manpower Composition :** The staff should have the staffs of an analyst, and programmer.

The Architecture of MIS : The architecture of the MIS plan provides a system and subsystem structure and their input, output and linkage. It spells out in details the subsystem from the data entry to processing, analysis to modeling and storage to printing.

The System Development Schedule : A schedule is made for development of the system. While preparing a schedule due consideration is given to importance of

the system in the overall information requirements. This development schedule is to be weighed against the time scale for achieving certain information requirements.

Hardware and Software Plan : Giving due regards to the technical and operational feasibility, the economics of investment is worked out. Then the plan of procurement is made after selecting the hardware and software. One can take the phased approach of investing starting from the lower configuration of hardware going to the higher as development take place. The process needs matching the technical decisions with the financial decisions.

Q.10 What are the stages of Development of MIS?

Ans.: In order to develop a system successfully, it is managed by breaking the total development process into smaller basic activities or phases. Any system development process, in general, is understood to have the following phases :

- i) Systems Planning
- ii) Systems Analysis
- iii) Systems Design
- iv) Systems Implementation
- v) Systems Operation and Support

Q.11 What are different approaches to Development of MIS?

Ans.: There are two basic approaches for development of MIS :

- a) **System development life cycle :** The system development life cycle have following steps of development :
 - i) Systems Planning
 - ii) Systems Analysis
 - iii) Systems Design
 - iv) Systems Implementation
 - v) Systems Operation and Support (System Maintenance)
- b) **Prototyping :** Prototyping is the process of creating an incomplete model of the future full-featured system, which can be used to let the users have a first idea of the completed program or allow the clients to evaluate the program.

Advantages :

- i) The designer and implementer can obtain feedback from the users early in the project development.
- ii) The client and the contractor can compare that the developing system matches with the system specification, according to which the system is built.
- iii) It also gives the engineer some idea about the accuracy of initial project estimates and whether the deadlines can be successfully met.

The process of prototyping involves the following steps :

- i) Identify basic requirements.
- ii) Develop initial prototype.
- iii) **Review** : The customers, including end-users, examine the prototype and provide feedback for additions or changes.
- iv) **Revise and Enhance the Prototype** : Using the feedback both the specifications and the prototype can be improved. If changes are introduced then a repetition of steps 3 and 4 may be needed.

Types of prototyping : System prototyping are of various kinds. However, all the methods are in some way based on two major types of prototyping :

- **Throwaway Prototyping** : Throwaway or Rapid Prototyping refers to the creation of a model that will eventually be discarded rather than becoming part of the finally delivered system. After preliminary requirements gathering is accomplished, a simple working model of the system is constructed to visually show the users what their requirements may look like when they are implemented into a finished system. The most obvious reason for using Throwaway Prototyping is that it can be done quickly.
- **Evolutionary Prototyping** : Evolutionary Prototyping (also known as **Breadboard Prototyping**) is quite different from Throwaway Prototyping. The main goal when using Evolutionary Prototyping is to build a very good prototype in a structured manner so that we can refine it or make further changes to it. The reason for this is that the Evolutionary prototype, when built, forms the heart of the new system, and the improvements and further requirements will

be built on to it. It is not discarded or removed like the Throwaway Prototype. When developing a system using Evolutionary Prototyping, the system is continually refined and rebuilt.

- **Incremental Prototyping** : The final product is built as separate prototypes. At the end the separate prototypes are merged in an overall design.

Advantages of Prototyping :

- Reduced Time and Costs** : Prototyping can improve the quality of requirements and specifications provided to developers. Early determination of what the user really wants can result in faster and less expensive software.
- Improved and Increased User Involvement** : Prototyping requires user involvement and allows them to see and interact with a prototype; allowing them to provide better and more complete feedback and specifications. Since users know the problem better than anyone, the final product is more likely to satisfy the users desire for look, feel and performance.

Disadvantages of Prototyping :

- Insufficient Analysis** : Since a model has to be created, developers will not properly analyse the complete project. This may lead to a poor prototype and a final project that will not satisfy the users.
- User Confusion of Prototype and Finished System** : Users can begin to think that a prototype, intended to be thrown away, is actually a final system that merely needs to be finished or polished. Users can also become attached to features that were included in a prototype for consideration and then removed from the specification for a final system.
- Excessive Development Time of the Prototype** : A key property to prototyping is the fact that it is supposed to be done quickly. If the developers forget about this fact, they will develop a prototype that is too complex.
- Expense of Implementing Prototyping** : The start up costs for building a development team focused on prototyping may be high. Many companies have to train the team for this purpose which needs extra expenses.

Q.12 What do you understand by System Analysis? And discuss the techniques of System Analysis?

OR

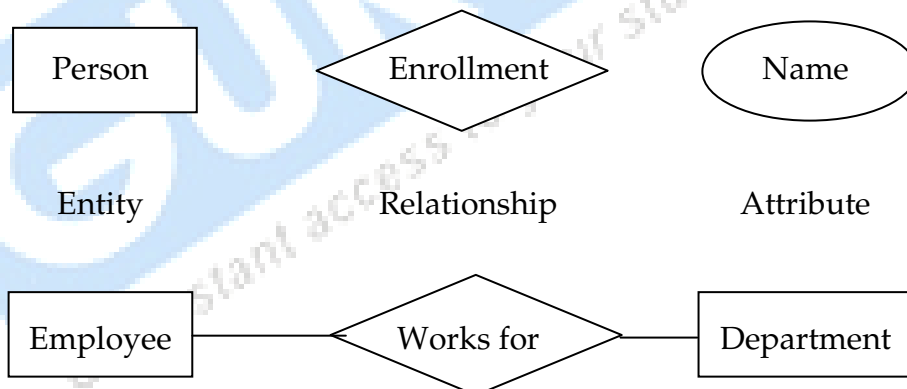
What are the different tools for the System Analysis?

Ans.: Following tools are used for system analysis :

(1) **Entity – Relationship Diagrams** : The object-relationship pair can be represented graphically using an ER diagram. An entity represents an object. Examples: a computer, an employee, a song, a mathematical theorem. Entities are represented as rectangles.

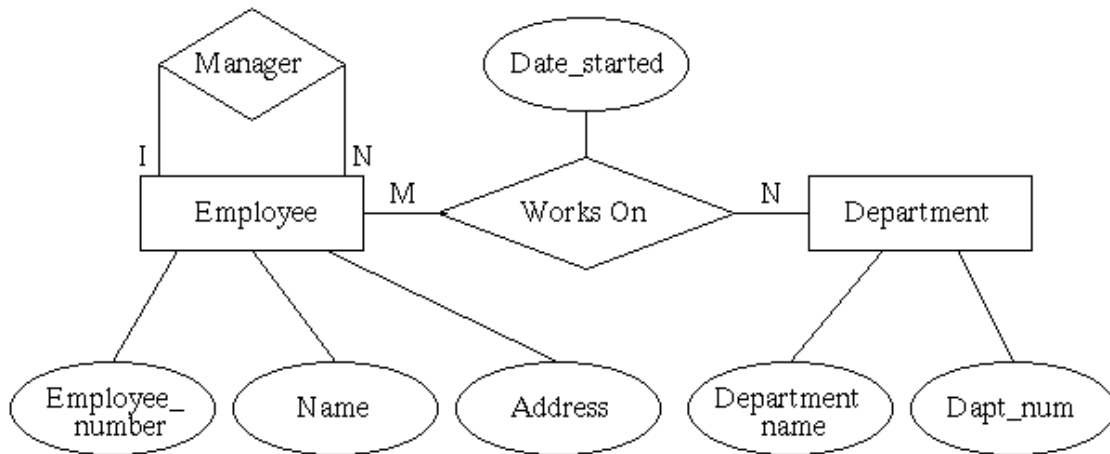
A relationship captures how two or more entities are related to one another. Examples: an *owns* relationship between a company and a computer, a *supervises* relationship between an employee and a department, a *performs* relationship between an artist and a song. Relationships are represented as diamonds, connected by lines to each of the entities in the relationship.

Entities and relationships can both have attributes. Examples: an employee entity might have an employee ID number attribute; the *proved* relationship may have a *date* attribute. Attributes are represented as ellipses connected to their entity by a line.



A simple E-R diagram

The following E-R diagram gives the attributes as well -



An E-R diagram with attributes

- (2) **Structured English** : Structured English, as the name implies, is “English with structure.” That is, it is a subset of the full English language with some major restrictions on the kind of sentences that can be used and the manner in which sentences can be put together. It is also known by such names as PDL (Program Design Language) and PSL (Problem Statement Language or Problem Specification Language). Its purpose is to strike a reasonable balance between the precision of a formal programming language and the casual informality and readability of the English language.

In Structured English you can use simple verbs from a small set of action-oriented verbs such as:

GET (or ACCEPT or READ)
 PUT (or DISPLAY or WRITE)
 FIND (or SEARCH or LOCATE)
 ADD
 SUBTRACT
 MULTIPLY
 DIVIDE

Most organizations find that 40 to 50 verbs are sufficient to describe any policy in any process specification.

- (3) **Decision Tables** : There are situations where structured English is not appropriate for writing process specifications. This is particularly true if the process must produce some output or take some actions based on complex decisions. If the decisions are based on several different variables (e.g., input data elements), and if those variables can take on many different values,

then the logic expressed by structured English or pre/post conditions is likely to be so complex that the user won't understand it. A decision table is likely to be the preferred approach.

As shown in Figure, a decision table is created by listing all the relevant variables (sometimes known as conditions or inputs) and all the relevant actions on the left side of the table; note that the variables and actions have been conveniently separated by a heavy horizontal line. In this example, each variable is a logical variable, meaning that it can take on the value of true or false.

In many applications, it is easy (and preferable) to express the variables as binary (true-false) variables, but decision tables can also be built from multivalued variables; for example, one could build a decision table with a variable called "customer-age" whose relevant values are "less than 10," "between 10 and 30," and "greater than 30."

	1	2	3	4	5	6	7	8
Age > 21	Y	Y	Y	Y	N	N	N	N
Sex	M	M	F	F	M	M	F	F
Weight > 150	Y	N	Y	N	Y	N	Y	N
Medication 1	X				X			X
Medication 2		X			X			
Medication 3			X			X		X
No medication				X			X	

A Typical Decision Table

Next, every possible combination of values of the variables is listed in a separate column; each column is typically called a *rule*. A rule describes the action (or actions) that should be carried out for a specific combination of values of the variables. At least one action needs to be specified for each rule (i.e., for each vertical column in the decision table).

- (4) **Data Dictionary** : A data dictionary is a structured repository of data, about data. In other words it is set of precise and accurate definitions of all DFDs, data elements and data structures.

There are three main items present in a data dictionary :

- i) **Data Item** : It is the smallest unit of data and cannot be decomposed further.

- ii) **Data Structures** : It is a group of elements handled as a unit. A data structure contains a number of data elements as its fields,
- iii) **Data Flows and Data Stored** : Data flows are nothing but data structure in motion where the data stores are data structures at rest.

Data Dictionary Notation : There are many common notational schemes used by systems analyst. The one shown below is the more common, and it uses a number of simple symbols:

= is composed of

+ and

() optional (may be present or absent)

{ } iteration

[] select one of several alternative choices

** comment

@ identifier (key field) for a store

| separates alternative choices in the [] construct

As an example, we might define name as follows :

name = courtesy-title + first-name + (middle-name) + last-name

courtesy-title = [Mr. | Miss | Mrs. | Ms. | Dr. | Professor]

first-name = {legal-character}

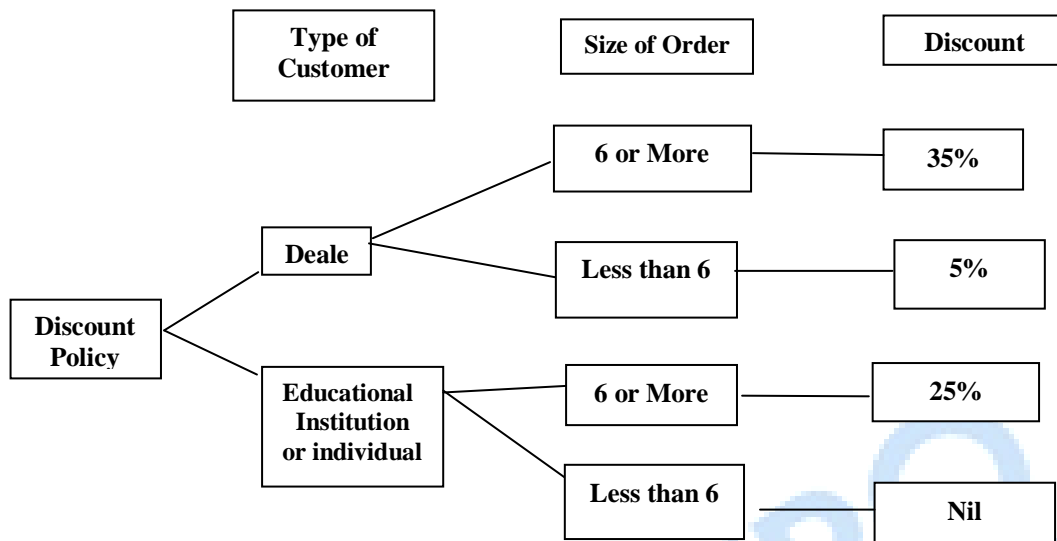
middle-name = {legal-character}

last-name = {legal-character}

legal-character = [A-Z|a-z|0-9|'|'-| |]

- (5) **Decision Tree** : Decision trees are graphical representation methods of representing sequences of logical decisions. When initial decision guided the next, when and then next one. This can be done with Decision Tree.






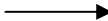
In decision analysis, a **decision tree** (or tree diagram) is a decision support tool that uses a graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility. A decision tree is used to identify the strategy most likely to reach a goal. Another use of trees is as descriptive means for calculating conditional probabilities.



- (6) **Flow Charts** : The flowchart is a means of graphical representation of the flow of data through an information processing system, the operations performed within the system and the sequence in which they are performed. A programmer prefers to draw a flowchart prior to writing a computer program. As in the case of the drawing of a blueprint, the flowchart is drawn according to defined rules and using standard flowchart symbols.

“A flowchart is a diagrammatic representation that illustrates the sequence of operations to be performed to get the solution of a problem.”

Guidelines for Drawing a Flow Chart : Flowcharts are usually drawn using some standard symbols; however, some special symbols can also be developed when required. Some standard symbols, which are frequently, required for flowchart for many computer programs are as follows :

	Start or end of the program
<hr/>  <hr/>	Computational steps or processing function of a program
<hr/>  <hr/>	Input or output operation
<hr/>  <hr/>	Decision making and branching
	Connector or joining of two parts of program
	Flow Lines

Flowchart Symbols

Advantages of Using Flowcharts :

- i) **Communication** : Flowcharts are better ways of communicating the logic of a system to all concerned.
- ii) **Effective Analysis** : With the help of flowchart, problems can be analyzed in more effective way.
- iii) **Proper Documentation** : Program flowcharts serve as a good program documentation, which is needed for various purposes.
- iv) **Efficient Coding** : The flowcharts act as a guide or blueprint during the systems analysis and program development phase.
- v) **Proper Debugging** : The flowchart helps in debugging process.
- vi) **Efficient Program Maintenance** : The maintenance of operating program becomes easy with the help of flowchart. It helps the programmer to put efforts more efficiently on that part.

Limitations of Using Flowcharts :

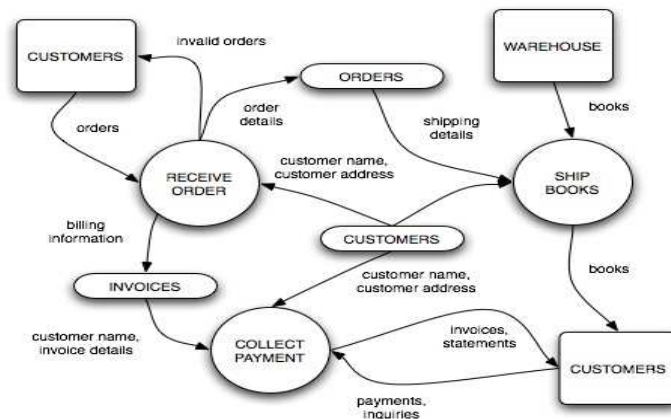
- i) **Complex Logic** : Sometimes, the program logic is quite complicated. In that case, flowchart becomes complex and clumsy.

- ii) **Alterations and Modifications** : If alterations are required the flowchart may require re-drawing completely.
 - iii) **Reproduction** : As the flowchart symbols cannot be typed, reproduction of flowchart becomes a problem.
 - iv) The essentials of what is done can easily be lost in the technical details of how it is done.
- (7) **Data Flow Diagram** : DFD is graphical modeling tool for structured analysis. The dataflow diagram is a modeling tool that allows us to picture a system as a network of functional processes, connected to one another by “pipelines” and “holding tanks” of data. Following terms are used as synonyms for dataflow diagram :

- Bubble Chart
- DFD (the abbreviation we will use throughout this book)
- Bubble Diagram
- Process Model (or Business Process Model)
- Business Flow Model
- Work Flow Diagram
- Function Model
- A picture of what’s going on around here

The dataflow diagram is one of the most commonly used systems-modeling tool, particularly for operational systems in which the *functions* of the system are of paramount importance and more complex than the data that the system manipulates.

The Components of a DFD : Following diagram shows a typical DFD for a small system. Before we examine its components in detail, notice several things: -



A Typical DFD has following features :

- It hardly needs to be explained at all;
- The diagram fits easily onto one page.
- The diagram has been drawn by a computer.

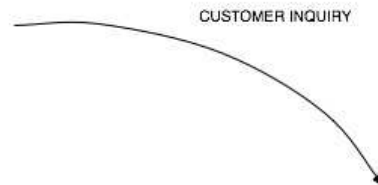
The Process : The first component of the DFD is known as a process. Common synonyms are a bubble, a function, or a transformation. The process shows a part of the system that transforms inputs into outputs; that is, it shows how one or more inputs are changed into outputs. The process is represented graphically as a circle, oval or a rectangle with rounded edges, or rectangle,



Process

The Flow : A *flow* is represented graphically by an arrow into or out of a process; The flow is used to describe the movement of chunks, or packets of information from one part of the system to another part. Thus, the flows represent data in motion, whereas the stores represent data at rest.

An example of a flow :



The name represents the meaning of the packet that moves along the flow. A corollary of this is that the flow carries only one type of packet, as indicated by the flow name. It is sometimes useful to consolidate several elementary dataflows into a consolidated flow.

The Store : The store is used to model a collection of data packets at rest. The notation for a store is two parallel lines or a rectangle open with one side.; Typically, the name chosen to identify the store is the plural of the name of the packets that are carried by flows into and out of the store.



Graphical Representation of a Store

We can to exclude the issues and model only the *essential* requirements of the system.

As we have seen in the examples thus far, stores are connected by flows to processes. Thus, the context in which a store is shown in a DFD is one (or both) of the following :

- A flow from a store
- A flow to a store

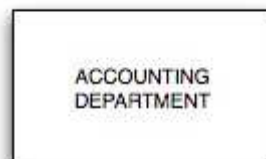
In most cases, the flows will be labeled. While some of the procedural questions can thus be answered by looking carefully at the labels attached to a flow, not all the details will be evident.

A flow from store is often described as a read.

A flow to a store is often described as a write, an update, or possibly a delete.

In all these cases, it is evident that the store is changed as a result of the flow entering the store. It is the process (or processes) connected to the other end of the flow that is responsible for making the change to the store.

The Terminator : The next component of the DFD is a *terminator*; it is graphically represented as a rectangle, Terminators represent external entities with which the system communicates. Typically, a terminator is a person or a group of people, for example, an outside organization or government agency, or a group or department that is *within* the same company or organization, but *outside* the control of the system being modeled. In some cases, a terminator may be another system, for example, some other computer system with which your system will communicate.



Graphical representation of a terminator;

Guidelines for constructing DFDs : The guidelines include the following :

- i) **Choosing Meaningful Names for Processes, Flows, Stores and Terminators :** As we have already seen, a process in a DFD may represent a *function* that is being carried out, or it may indicate how the function is being carried out, by identifying the person, group, or

mechanism involved. A good discipline to use for process names is a verb and an object.

- ii) **Number the Processes** : As a convenient way of referencing the processes in a DFD, most systems analysts number each bubble. It doesn't matter how much you go about doing this — left to right, top to bottom, or any other convenient pattern will do -- *as long as you are consistent in how you apply the numbers.*
- iii) **Avoid Overly Complex DFDs** : The purpose of a DFD is to accurately model the functions that a system has to carry out and the interactions between those functions. But another purpose of the DFD is to be read and understood, not only by the systems analyst who constructed the model, but by the users who are the experts in the subject matter. This means that the DFD should be readily understood, easily absorbed, and pleasing to the eye.
- iv) **Redraw the DFD As Many Times As Necessary** : In a real-world systems analysis project, DFD will have to be drawn, redrawn, and redrawn again, often as many as ten times or more, before it is (1) technically correct, (2) acceptable to the user, and (3) neatly enough drawn that you wouldn't be embarrassed to show it to the board of directors in your organization.

Q.13 What do you understand by System Analysis and Design? Discuss the various steps in System Analysis and Design Process?

OR

What are different stages in System Development Life Cycle?

Ans.: SAD refers to the process of examining a business situation with the intent of improving it through better procedures & methods. System Development generally is thought of as having two major components :

- a) System Analysis
- b) System Design

System Design is the process of planning. We must thoroughly understand the existing system and data mine how computer desk can be used to make its operation more effective. System design specifies how to achieve objectives

System Analysis is the process of gathering and interpreting facts diagnosing problems and using information to recommend improvement to system. It specifies what the system should do. The system analysis is management

between techniques which helps us in designing a new system or improving an existing system

System Development Life Cycle : System Development life cycle (SDLC) is used to plan and manage the system development process. Although it is primarily identified with structured analysis, the SDLC describes activities and functions that systems developers typically perform, regardless of how those activities and functions fit into a particular methodology. The SDLC model includes the following steps :

- i) Systems Planning
- ii) Systems Analysis
- iii) Systems Design
- iv) Systems Implementation
- v) Systems Operation and Support

The SDLC is pictured as a waterfall model where the result of each phase, often called an end product or deliverable, flows down into the next phase. In reality, the systems development process is dynamic, and constant change is common.

Systems Planning : A system's planning usually begins with a formal request to the IT department, called a system's request that describes problems or desired changes in an information system or a business process. A system's request can come from a top manager, a planning team, a department head, or the IT department itself. The request can be very significant or relatively minor. A major request might involve a new information system or the replacement of an existing system that cannot handle current requirements. In contrast, a minor request might ask for a new feature or a change to the user interface in current system. The purpose of the planning phase is to identify clearly the nature and scope of the business opportunity or problem by performing a preliminary investigation, often called a feasibility study. The preliminary investigation is a critical step because the outcome will affect the entire development process. The end product, or deliverable, is a report that describes business considerations, reviews anticipated benefits and costs, and recommends a course of action based on economic, technical, and operational factors.

Systems Analysis : The purpose of the systems analysis phase is to understand business requirement and build a logical model of the new system. The first step is requirement modeling, where you define and describe business process. Requirement modeling continue the investigation that began during systems planning and involves various fact-finding techniques, such as interview, surveys, observation, and sampling. During the next tasks, data modeling, process modeling, and object modeling, you develop a logical model of business

process the system must support. The model consists of various types of diagrams, depending on the methodology being used.

The end product for the systems analysis phase is the System Requirements Document. The systems requirements document describes management and user requirements, alternative plans and costs, and analysis your recommendation. Looking ahead to design and implementation, several possibilities exist: develop a new system in-house, purchase a commercial package, or modify an existing system.

Systems Design : The purpose of systems design is to create a blueprint for the new system that will satisfy all documented requirements, whether the system is being developed in-house or purchased as a package. During systems design, you identify all necessary outputs, inputs, interfaces, and processes. In addition, you design internal and external controls, including maintainable, and secure. The design is documented in the System Design Specification and presented to management and users for their review and approval. Management and user involvement is critical to avoid any misunderstandings about what the new system will do, how it will do it, and what it will cost.

Systems Implementation : During systems implementation, the new system is constructed. Programs are written, tested, and documented, and the system is installed. If the system was purchased as a package, systems analysts perform any necessary modifications and configurations. The objective of the implementation phase is to deliver a completely functioning and documented information system. At the conclusion of this phase, the system is ready for use. Final preparations include converting data to the new system's files, training of users, and performing the actual transition to the new system. The systems implementation phase also includes an assessment, called a systems evaluation, to determine whether the system operates properly and its costs and benefits are within expectations.

Systems Operation and Support (Maintenance) : During systems operation and support, the IT staff maintains and enhances the system. Maintenance corrects errors and adapts to changes in the environment, such as new tax rates. Enhancements provide new features and benefits. The objective during this phase is to maximize return on the IT investment. A well-designed system will be reliable, maintainable, and scalable. A scalable design can expand to meet new business requirements and volumes. Information systems development is always a work in progress. Business processes change rapidly, and most information systems need to be replaced or significantly updated after several years of operation.

Q.14 Write note on Feasibility and Cost- Benefit Analysis?

Ans.: Feasibility study is an outcome of the preliminary investigation and determination whether the system requested is feasible or not. It requires the need for a rigorous feasibility study.

Following are the different types of feasibility, but they are interrelated :

Technical Feasibility : This is concerned with specifying equipments and software that will successfully satisfy the user requirements, investigating whether the technology exists to implement the proposed system, or whether this is a practical proposition.

Operational Feasibility : Operational feasibility is concerned with whether the current work practices and procedures are adequate to support the new system. It is also concerned with social factors - how the organizational change will affect the working lives of those affected by the system.

Economic Feasibility : The procedure is to determine the benefit and savings that are expected from a proposed system. Economic feasibility has to do with establishing the cost-effectiveness of the proposed system - if the benefits do not outweigh the costs, then it is not worth going ahead. The process used for economic feasibility is cost benefit analysis.

Management Feasibility : Management feasibility is determination of whether a proposed system will be accepted by management people.

Social Feasibility : Social feasibility is determination of whether a proposed system will be acceptable to the people or not. .This determination typically examines the probability of the project being acceptable by the group directly affected by the proposed system change.

Legal Feasibility : Legal feasibility is a determination of whether a proposed project infringes on known Act, status, as well as any pending legislation.

Time Feasibility : Time feasibility is a determination of whether a proposed project can be implemented fully within time frame. If a project takes too much time it is likely to be rejected.

Cost - Benefit Analysis : Since the cost plays an important role in deciding the new system, it must be identified and estimated properly. Benefits of different type can be grouped on the basis of advantages they provide to the management. Benefits of a project include four types:

Cost Saving Benefits : Leads to reductions in administrative and operational costs, example reduction in the clerical staff.

Cost Avoidance Benefits : Those which eliminate future administrative and operational costs, example no need to hire additional staff in future to handle administrative activity.

Improved Service Level Benefits : Those where the performance of a system is improved by new computer based method, example registering a student in fifteen minutes rather than 30 minutes.

Improved Information Benefit : Those where computer based methods lead to better information for decision making. A system that reports most-improved fifty customers, as measured by an increase in sales is an improved-information.

Categories of Costs and Benefits : The cost associated with the system are expenses, outlays or losses arising from developing and using the system.

Costs and Benefits can be classified as follows :

- a) **Tangible or Intangible Costs and Benefits :** Tangible refers to ease with which costs or benefits can be measured. An outlay of cash for any specific item or activity is referred to as a tangible cost.

Costs that are known to exist but their financial value cannot be exactly measured are referred to as intangible costs. The estimation is only an approximation. For example Employee movable problem because of installing new system is an intangible cost.

Tangible benefits such as computer jobs in fewer hours or producing error free reports are quantifiable. Intangible benefits such as more satisfied customers or an improved corporate image because of using new system are not easily quantified.

- b) **Direct and Indirect Costs & Benefits :** direct costs are those which are directly associated with a system. They are applied directly to operator.

Direct benefits also can be especially attributable to a given project. For example, a new system that can process 30 percent more transaction per day is a direct benefit.

Indirect costs are not directly associated with a specific activity in the system. They are often referred to as overhead expenses, e.g. cost of space to install a system, maintenance of computer center, light are tangible costs but it is difficult to calculate the proportion of each attribute to a specific activity such as a report.

Indirect benefits are realized as a by-product of another system, e.g. a system that takes sales calls on customer provides an indirect marketing benefit by giving additional information about competition.

- c) **Fixed or Variable Costs & Benefits :** Some costs and benefits remain constant, regardless of how a system is used. Fixed are considered as sunk costs. For e.g. the purchase of equipment for a computer center is called as fixed cost as it remains constant whether equipment is being used extensively or not.

Variable costs are incurred on a regular basis they are generally proportional to work volume and continue as long as the system is in operation. For example the cost of computer forms varies in proportion to amount of processing.

Fixed benefits also remain constant. By using a new system, if 20 % of staff members are reduced, we can call it a fixed benefit. Variable benefits, on the other hand, are realized on a regular basis. For example the library information system that saves two minutes in providing information about a particular book whether it is issued or not, to the borrower compared with the manual system. The amount of time saved varies with the information given to the number of borrowers.

Cost Benefit Analysis : We define cost benefit analysis as -

- a) The method by which we find and estimate the value of gross benefits of a new system specification
- b) The method by which we find and determine the increased costs associated with the above mentioned gross benefits.
- c) The subtraction of these operating costs and associated gross benefits to arrive at total benefits.
- d) Those methods by which we find and estimate the monetary values of the development costs that produce the above mentioned benefits.
- e) Those methods by which we show the time-phased relationship between new benefits and development costs as they are related to each cash flow, payback on investments, and time in process taking into operation.

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Chapter-3

Development of MIS

Q.1 What are the different steps in System Implementation?

Ans.: There are four basic methods for system implementation :

- (i) Install a system in a new operation or organization, one just formed.
- (ii) Cut off the old system and install new. This produces a time gap during which no system is in operation.

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- (iii) Cut over by segments, this method is also referred to as “phasing in” in the new system. Small parts or subsystems are substituted for the old.
- (iv) Operate in parallel and cut over. The new system is installed and operated in parallel with the current system until it has been checked out; then the current system is cut out.

Following are steps in system implementation :

- (A) **Plan the Implementation :** The three main phases in implementation take place in series; these are the initial installation; the test of the system as a whole; and the evaluation –maintenance and control of the system.

The first step is plan for implementation that having the following steps:

- (i) **Identify the Implementation Task :** Before starting implementation system analyst should identify the implementation tasks. The plans should list all subtasks for each of these major tasks so that individuals in the organization may be assigned specific responsibilities.
 - (ii) **Establish Relationship Among Task :** In the small system, the order of performance may be simply be described in text form. In large project, many concurrent and sequential activities are interrelated, so that a network diagram must be employed in any good plan.
 - (iii) **Establish a Schedule :** A first estimation of the schedule is prepared by having a system designer estimate the times between the events in the program network. The critical time should be calculated. Management may apply pressure or provide additional personnel to shorten the network times.
 - (iv) **Prepare the Cost Schedule ties to Tasks and Time :** The cost for completing each milestone and possibly each task required to complete a milestone, should be established as part of the plan, then the rate of expenditure should be budgeted.
 - (v) **Establish a Reporting and Control System :** Reporting and control of the work in progress may be obtained by weekly meetings of the key people involved or by brief written progress reports. The objective of the control system is to minimize the confusion and the associated delays and costs.
- (B) **Acquire Floor Space and Plan Space Layout :** The installation of a new system to replace a current one may require a major revision of facilities as well as completely new office, computer room and production layouts. The MIS manager must prepare rough layouts and estimates of particular

floor areas he or she feels needed. The manager should prepare cost estimates for this.

- (C) **Organize the Implementation :** Once the implementation tasks have been defined in the planning phase, manager usually assigns a project manager to guide the implementation. A manager of MIS may assume this responsibility by virtue of a permanent assignment.
- (D) **Develop Procedures for Implementation :** The project leader has available the network plan for proceeding with the implementation. The leader must now call upon key people in the project to prepare more detail procedure for system implementation. The system analyst must develop the procedure for delivering instructions and forms to supervisors, for coordinating and integrating this very small portion of the MIS with other parts of the manufacturing system, and for the working out the problem involved.
- (E) **Train the Operating Personnel :** A program should be develop to support management and personnel the nature and goals of the MIS and to training of operating personnel in their new duties. Practical attention should be paid the training of first –line supervisors, then to professional support personnel like accounting and production personnel and then operational personnel like clerk etc.
- (F) **Computer Related Acquisition :** Computer related acquisition have the following basic parts :
 - (i) **Hardware :** hardware can be purchased according to requirements of system.
 - (ii) **Software :** In small firm the software might be purchased. In large firm with specialized forecasting, planning, operating and control models most software must be developed internally and under contract.
 - (iii) **Personnel :** Implementation of an MIS offers the company an opportunity to upgrade and promotes the personnel after training. A personnel chart should be prepared showing the number of individuals are required in terms of skills, the source and the date they will be required to work.
 - (iv) **Materials :** Forms and manuals are the principal materials to be ordered for the MIS.
- (G) **Develop Forms for Data Collection and Information Dissemination :** A vast amount of detailed data, both external and internal to the company, must be colleted for input to the MIS. Forms are required not just for input

and output but also for transmitting data at intermediate stages. So the form should be developed to collect data.

- (H) **Develop the Files :** In the implementation stage, the actual data must be obtained and recorded for the initial testing and operation of the system. This requires a checklist of data, format of data, storage form and format, and remarks to indicate when the data have been stored. The implementation also requires the development of a procedure for updating each piece of the data and for updating entire sections of the files required. The translation of specifications for files into computer programs is the function of computer specialists.
- (I) **Test the System :** As each part of the system is installed, test should be performed in accordance with the test specifications and procedures described earlier. Tests during the installation stage consist of component tests, subsystem tests, and total system acceptance tests. Components test may include; equipments, old and new; new forms; new software; new data collection methods; new work procedures and new reporting formats.. As more subsystem installed subsystem may be tested.
- (J) **Cutover :** Cutover is the point at which the new component replaces the old component or the new system replaces the old system. This usually involves a good deal of last-minute physical transfer of the files, rearrangement of office furniture and movement of work stations and people. Old forms, old files, and old equipments are suddenly retired.
- (K) **Document the System :** documentation of the system means preparation of written descriptions of the scope, purpose, information flow components and operating procedures of the system. Documentation is not a frill ; it is a necessary –for troubleshooting, for the replacement of the subsystems, for interfacing with other system, for training new operating personnel and also for evaluating and updating the system.

Q.2 How Organizations evaluate the MIS.

Ans.: After the MIS has been operating smoothly for a short period of time, an evaluation of each step in the design and final system performance should be made. Evaluating should not be delayed beyond the time when the system analysts have completed most of the debugging. The longer delay, it will be more difficult for designer to remember the important details.

The evolution should be made by the customer as well as by the designers. It is less important than the previous evaluation, the financial specialists should evaluate the project in terms of planned cost versus actual cost of design,

implementation and operation. They should also attempt to identify cost savings and increased profit directly attributable to the MIS.

Following structure is generally used to partial evaluation :

Structure : The measurements of the costs and benefits are the measurement of the changes or differences between the old and new. The measurement of the change must be related to the basic goals of the MIS, the principle activities that further these goals, or the many minor activities that further these goals. In other words, we may measure the changes in the total output of the system or measure the many changes accomplished throughout the system. The former is obviously the most desirable.

What we have is the hierarchy of levels at which we are consider measuring costs and benefits.

Following table shows the hierarchy :

Level	Hierarchy in the MIS	Change that is Measured
1	Company Profit (Return on Investment)	Dollars
2	Company Costs & Revenues	Dollars
3	Planning Control	Specificity, quantification, degree to which plans are achieved. Degree of control by exception, selection of activities to be controlled, forwarding of activities going beyond acceptable limits, managerial time required for control, automation of control of repetitive situation
4	Decisions	Quality of decisions, frequency of reversal of decision of decisions superior in the organization.
5	Information	Validity, accuracy, clarity, distribution, frequency, appropriateness of detail for each level of management, timeliness, format, availability on demand, selectivity of content, disposition method, retention time, cost.
6	System Characteristics	Number of people required,

		equipments and facilities, response time, frequency of breakdowns, inputs, outputs, number of forms, number of operations, size and quality of data bank.
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For a particular MIS, The designer may select the level at which measurement is to take place based upon specific objectives of the MIS. It is probably rare that a measurement of the total system is attempted at the system level. At the system level, judgment of broad concepts might be employed :

- (i) **System Integrity** : How well the subsystems integrated into the total system without redundancy? How flexible is the system? How easily may the system be explained?
- (ii) **Operation Integrity** : How skilled are the people operating the system? What backup is there to prevent the system breakdown in the event of loss of key personnel or equipment failure?
- (iii) **Internal Integrity** : How well does the system do what it is supposed to do? How valid are the system outputs? How sources is the system against human error, manipulation, sabotage, or theft.
- (iv) **Procedural Integrity** : How good is the documentation of the system and procedures? Are procedures such that employee are motivated to follow them? How well are procedures followed in practice? What controls ensure that the procedures are followed?

Formulation of the Measurement : Once the variables of interest have been identified, a table should be set up to formalize the measurement. Table can contain the costs and benefits.

Q.3 What are Pitfalls in MIS Development?

Ans.: Following are the pitfalls of the MIS development :

- (A) **Fundamental Weaknesses** : Following are the fundamental weaknesses of the MIS development :
 - (a) **No Management System to Build Upon** : The MIS must be built on top of a management system that includes the organizational arrangements, the structure and procedures for adequate planning and control, the clear establishment of objectives, and all the other manifestations of good organization and management. The lack managerial and operational application is serious because it implies that the process not being performed well. if we can say

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that the information is the raw material of decision making , and if information is not generated, disseminated and used for management, then no system-manual or computer-is going to solve the problem.

- (b) **What business are we in?** : Not having the crispy stated mission and purpose for the company is a common weakness. Since if it is not terrible clear what business we are in, each major challenge the company must face is a completely new challenge and must be analyzed from the ground up. If there was a mission statement, some of these problem could be dealt with routinely as opposed to their being major crises.
- (c) **Company Objectives** : written objective are also often missing in the company. A firm without objectives is much like a company without a statement of mission and purpose –it is a ship without rudder. Without the business objectives, the chances of the MIS satisfying management needs are slight.
- (d) **Managerial Participation** : MIS development has been viewed as responsibility of management. This includes both top level management and operating line management. The reasonable conclusion that manager must reach is that MIS is too to be left to the computer technician.
- (e) **Organization of the MIS Functions** : Another significant cause of computer failure is the lack of proper organization of the EDP and MIS. The exact location in the organization and the authority granted to the MIS manager is, of course , a function of the type business the firm is in and how important the information resource is to its operation.
- (f) **Reliance on Consultant of Manufacturer** : Some computer manufacturer and some consultant will try to sell the system, one that is designed and debugged and ready to push the button or turn on the key. Consultant and the manufacturer is concerned more with the machine than with the management solutions. Before buying the a 'solution' from a consultant or manufacturer , be sure that it is the whole solution , that you understand it thoroughly, and that you understand you legal resources when things do not work the way your expected.
- (g) **Communication Gap** : It is unlikely that for the foreseeable future the computer technician will be able to speak the language of management, and managers for the most part are not prepared to speak the languages of the computer. The result is a communication gap that some times causes a design stand off.

- (h) **The People Involved** : There is no substitute for competence. Good performers of people will worth the price.

(B) **Soft Spots in Planning :**

- (a) **MIS Response to the Business Plans** : The purpose of MIS group is to support line management in the company's main business. As business plans are made and modified , the corresponding MIS plans must be made and changed. Each MIS plan must be a proper response to a business plan.
- (b) **A System View : A Master Plan** : Another cause of computer failure is the lack of a master plan to which hardware development and individual MIS design can be related. The reasons for MIS planning are the same as for planning in general : A system.
- (c) **Setting Project and System Objectives** : setting objectives for projects and systems is not itself a planning activity. However not meaningful plans can made until these objectives have at least been roughed in. These two activities are co-requisite.
- (d) **Facing Constraints** : Freedom from constraints on financial definition, system performance, system cost, development schedule will leads to enormous MIS problems. It is essential that both managers and technician recognize the reality of those constraints and plan accordingly.
- (e) **Plan to Sale the MIS** : Most system designers admit to the unpleasant reality that the toughest part of the designing and implementation an MIS is gaining acceptance of the user for whom the system is designed. So the system should be designed in the manner that it can easily sale or accepted by the users.
- (f) **Detail Planning** : It is only method that permits one successful MIS project to follow another. All veteran MIS development managers know this and plan in detail for every phase of the project.

(C) **Design Problems :**

- (a) **Consider Alternatives Designs** : This is essential for the Manager to require the key designer to lay out the several alternative designs and explain the positive and negative features of each. Then he can select one
- (b) **Beware the User Interface** : It is a technical problem. The user interface should be according to user. User should be comfortable with the design or interface of the system.
- (c) **The Real World the acid Test** : Business organizations are not research institutes. The MIS is being implemented to support the

firm's main line of business, not to extend the state of art in MIS design.

- (d) **If It Moves Automate It** : Some things could be automated but not all. Like designer can easily design the computerized system for visitor. But people want and expect human interaction to at least immediately available when they enter the lobby of place of business.
- (e) **The Computer Obsession** : Computer should not be obsession in system. It is a tools and used as a tools only.
- (f) **Documentation** : Documentation should include: All plans, Project and system objective, specifications of functions and performance, user interface specifications, user instruction and reference manuals and maintenance guideline. These items are necessary to manage and use MIS over time. Not documenting these things in detail is a guarantee of failure in some part of the operation of MIS.

(D) **Implementation Problems :**

- (a) **Test It and Test It Again** : The most common error made with regards to testing is not planning to do enough of it. A good rule of thumb to use in project estimating and planning is 1/3 planning and design, 1/3 implementation, 1/3 testing. For an MIS project of any reasonable size, this figure for testing is by no means too much. Testing must be done at the fictional level, the component level, and the system level.
- (b) **Controlling the MIS Project** : although controlling is the one of the four basic management functions, it remains one of the preeminent cause of MIS development project failure.

Q.4 What do you understand by System Documentation?

Ans.: Documentation is any communicable material such as text, video, audio, etc., or combinations thereof used to explain some attributes of an object, system or procedure. It is often used to mean engineering documentation or software documentation, which is usually paper books or computer readable files such as HTML pages that describe the structure and components, or on the other hand, operation, of a system/product. You probably immediately think of printed training manuals when you think of "documentation" but there are several different forms for different occasions.

Characteristics of Good Documentation :

Clear : Able to be understood by whomever it was created for. The language used must be appropriate. Terms that may not be understood by everyone need to be explained either the first time they are used or in a glossary.

Concise : It should be as short as it can be while still being comprehensive. Using pictures can replace hundreds of words and be much clearer at the same time.

Complete : It should not leave out important information especially key steps that need to be completed, such as printing, and warnings about what not to do.

Current : It's no use if all the facts are out of date or superseded. Printed material is harder to keep current than electronic versions are.

Correct : It must not contain errors.

Easy to Access : It must be available where and when it is needed.

Easy to Search : Users must be able to quickly find the required information. Indexes or tables of contents are required, along with clear headings. Large documentation may well need to be divided into sections.

Types of Documentation :

Printed : The traditional format for documentation, it is used much less now days. Printing is expensive and books are heavy and bulky, which increase transportation costs. Books are hard to keep up-to-date if their subject matter is subject to change. Books can only be accessed by one person at a time.

Onscreen Help : Most programs come with online help that can be accessed immediately by user. It is readily accessible, searchable and can be very detailed. Help can also be gained from online sources such as the internet and intranets. Such sources can easily be kept up to date - even on a daily basis. They can be accessed by any number of people simultaneously.

Audiovisual : Videos, screen movies, audio narration etc. are colorful and engaging but do not tend to carry a lot of detailed information. These types of documentations are good for introductions or overviews of subjects.

Posters, Leaflets : Sometimes detailed information is not needed. A checkout chick, for example, does not need wiring diagrams for the circuits of the register. User may just need a little poster that quickly reminds her how to do basic tasks.

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Chapter-4

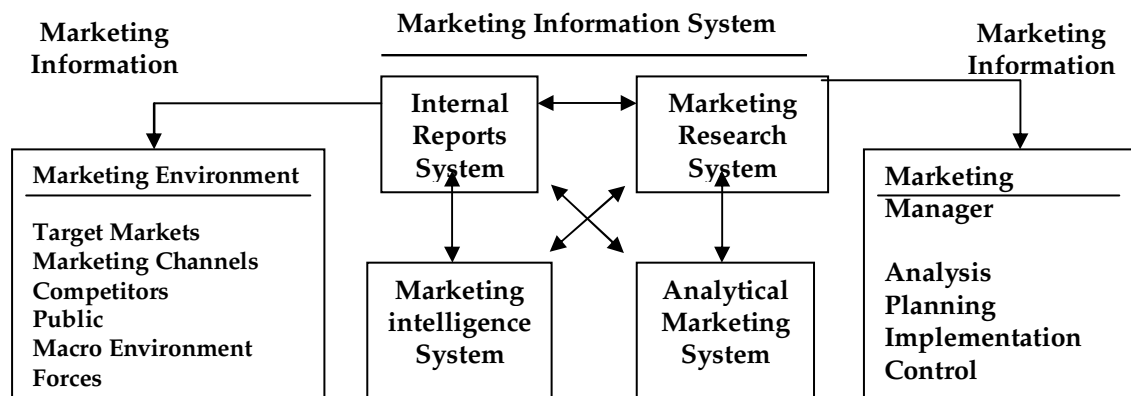
Functional MIS

Q.1 Write short notes on MIS for Finance, MIS for Marketing, MIS for Production, MIS for HRM.

Ans.: (A) MIS for Marketing : In order to pursue market opportunities as well as anticipate marketing problem, manager need to collect comprehensive and reliable information. Managers cannot carryout marketing analysis, planning, implementation and control without monitoring and researching customers , competitors, dealers and their sales and cost data. Every firm has many information flows of interest to marketing management. Many companies are studying their executive's information needs and design information system for marketing to meet these needs. Instead of plethora of unrelated data, an MIS combines various inputs and present integrated reports.

Definition : Marketing Information System is a continuing and interacting structure of people, equipments and procedures to gather, sort, analyze, evaluate, and distribute pertinent, timely and accurate information for use by marketing decision makers to improve their marketing planning, implementation and control activities.

Components of Marketing Information System : As shown in figure below, the box on the left shows components of the marketing environment that manager must monitor. Trends in the marketing environment are picked up and analyzed through four subsystems making up the marketing information system- Internal Accounting System, Marketing Intelligence System, Marketing Research System and Analytical Marketing System.



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Marketing Decisions and Communications

Internal Accounting System is the most basic information system used by marketing executives. It is the system that reports orders, sales inventory levels, receivable, payable. By analyzing the information, marketing managers can spot important opportunities and problems.

- **The Order Shipping Cycle :** Sales representatives, dealers and customers dispatch orders to the firm. The order department prepares multi-copy invoice and sends them to various departments. Out of stock items are back ordered. Shipped items are accompanied and sent to various departments. The company wants to carryout these steps quickly and accurately. The computer is harnessed to expedite the order shipping billing cycle.
- **Improving the Timeliness or Sales Reports :** Marketing executives receive sales reports some times, after the sales have taken place. Many companies complain that sales are not reported fast enough in their company. Marketing information system can improve these things rapidly.
- **Designing a User Oriented Report System :** In designing an advanced sales information system, the company should avoid certain pitfalls.

The marketing information system should represent a cross between what managers think they need, what managers really need and what is economically feasible. Management information system should provide the reports for all marketing departments. Information system can delete the unwanted system from the survey and from other departments and prepare reports which are required by different persons of marketing department.

- (B) **MIS for Personnel Management :** Personnel management has the primary objective of providing suitable manpower in number and with certain ability, skills and knowledge, as the business organization demands from time to time. Its goal is to control personnel cost through continuous increase in manpower productivity resorting to the following techniques :
- a) Motivation through Leadership and Job Enrichment
 - b) Grievance Handling
 - c) Structuring the Organization
 - d) Promotion and Rewards through Performance Appraisal
 - e) HRM through Training and Upgrading the Skills

The information and scope of personnel function have resulted in greater complexity in field. There is need to cope with incredible volume of information and maintaining it. There is need to classify, reclassify and cross this information. This can be achieved by computerized personnel system which enables personnel management to manage more efficiently and effectively and to provide more positive services to the organization.

Input for Personnel Development : The following documents serve as the input in personnel information system :

- Productivity Data on the Job
- Industry Data on Manpower, Skills, Qualification
- Bio-Data of Self and Family
- Personnel Application Form
- Attendance and Leave Record
- Appraisal Form
- Appointment Letter
- Wage/ Agreement
- Record Sources of Manpower, University, Institutes, and Companies

Components of Personnel Information : A computer based personnel information system is designed to support the operational, managerial and decision making functions of the personnel division in an organization. Following are the components of the personnel management information system:

- i) **Establishment Records :** Establishment relates to the setting up of budgets for appropriate staff levels and grades throughout the organization. The system should encompass these budgeted posts and report on variations between actual staff numbers and the budget numbers.
- ii) **Recruitment Records :** Details of all vacancies and applicants should be held by the system. These should show the status of each vacancy and of each applicant and should perform as much as possible of the administrative process. This will generally mean that the system should interface with a word processing system.
- iii) **Personnel Records :** These relate to identification data, current and historical salary and allowances data and various employees attributes such as grades and key dates.

- iv) **Pensions Records** : The system maintains all details of service entitlements of employees, contribution by both the employee and the organization to pension scheme, details of dependents, spouse and children, data required for actuarial purpose to verify the availability of the scheme and details and entitlements of employees who have become pensioners.
- v) **Training Records** : These include data relating to each employee's qualification, skills and experience. The system would also hold details of internal and external training courses and its relevant details.
- vi) **Absence records** : The system should allow for the recording of various absence types like sick leave, special leave etc. Input of this sub-system should be automatically reflected in the establishment sub-system.
- vii) **Industrial relations records** : The system should hold data to assist management in negotiations and planning for alternative strategies. Much of this would be held for normal administrative purpose. It is the facility to extract the data in meaningful terms, to be able to project forward and to test the impact of applying various rules and scenarios.

(C) **MIS for Financial Management** : Financial management function has a primary objective of meeting the financial needs of the business. The second objective of FM is to meet the statutory compliance by way of declaring the auditing financial result, submitting reports and returns to the govt. and Tax authorities and fulfill the obligations to the shareholders. FM uses variety of tools and techniques like Break Even Analysis, ABC Analysis, Ratio Analysis, Management Accounting and Cost Analysis.

Input Documents :

- o Receipts from customers, authorities, employees, share holders, financial institution and others.
- o Payment to suppliers, authorities, share holders, financial institutions and others.
- o Data from stock exchange on the shares prices consolidated financial results of the other companies etc.

Transactions are payments and receipts and they are documented through journal vouchers, bills, debit notes, credit notes, receipts and transfer documents.

Application of Financial Management Information System : The major application of financial management information system includes financial accounting system, which accounts for the financial transactions of the company and produces financial results for the company. It produces balance sheet for the company where the performance of the company is published in standard format prescribed by the govt. The system is made so comprehensive that it not only collects financial data but also collects data on different matters such as job, department, and division and so on. It forms a basis for certain reports which are required by the top level management. The users of the financial data base are finance managers, cost controller, auditors, material managers, marketing managers, company secretaries and the top management.

(D) MIS for Production Management : The objective of production management function is to provide manufacturing services to the organization. This involves the manufacturing of products of a certain specified quality and within certain costs in a stipulated time, fulfilling the promises given to the customer.

The production management function is supported by other functions like production, planning and control, industrial engineering, maintenance and quality control. It has a very strong interface with materials management function. The organization of production management differs according to the types of production i.e. job shop or continuous. It also varies with the production policy of the organization, like whether the production is initiated against a customer order or for stock.

The system methodology differs with respect to the manufacturing technology the organization has adopted. The goals of the production management are fuller utilization of the manufacturing capacity, minimal rejection, maximum uptime of plant and equipments meeting the delivery promises. The function is of key importance when business strength is in technology and manufacturing, and the market for product and services exist. The function is pegged with the responsibility of managing high investment in plant, equipment and machinery. It also has to control the large labour force at its disposal.

Inputs of Production Management Information System : The production management is conducted through innumerable transaction. They relate to planning, issuing and controlling the various task involved in the course of production.

- i) process Planning Sheet
- ii) quality Assurance Rating Form
- iii) Production Schedule

- iv) Process Planning Sheet
- v) Job Cards
- vi) Finished Goods Advice
- vii) Material Requisition
- viii) Customer Order
- ix) Breakdown Advice
- x) Material requirement
- xi) Production Programme

The production management also uses standards and norms extensively developed over a period of time as input in the system. These are generally known as production rate available capacity, labour components, material usage standards, rejection norms etc.

Documents mentioned above are indicative and may be more or less different, depending upon the type of production and nature of production of industry. The input data in each transaction would also vary from industry to industry as would the production methodology adopted by the organization. The system and procedures used by the organization in performing the production function also vary respectively.

Components of Production Management Information System : The components of production management information system include:

- a) Sales department to find out what the customer wants and to compare this with what the firm can provide.
- b) Design department to design new requirements and make modifications in established items either to bring them up to date or to make them meet a specific requirement of the customer.
- c) Purchasing department buys the material required at the best possible price and on the most reliable delivery to make the various items either on one off basis for individual job or replenish material held in the stores on maximum and minimum levels
- d) Manufacturing process sees that the parts are produced as economically as possible for delivery at the time required by the customer and to meet the standards set by the design department.

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