

Biyani's Think Tank

**Concept based notes**

# **Management Information Systems**

*(BCA Part-III)*

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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

## B.C.A. Part-III

### Management Information Systems

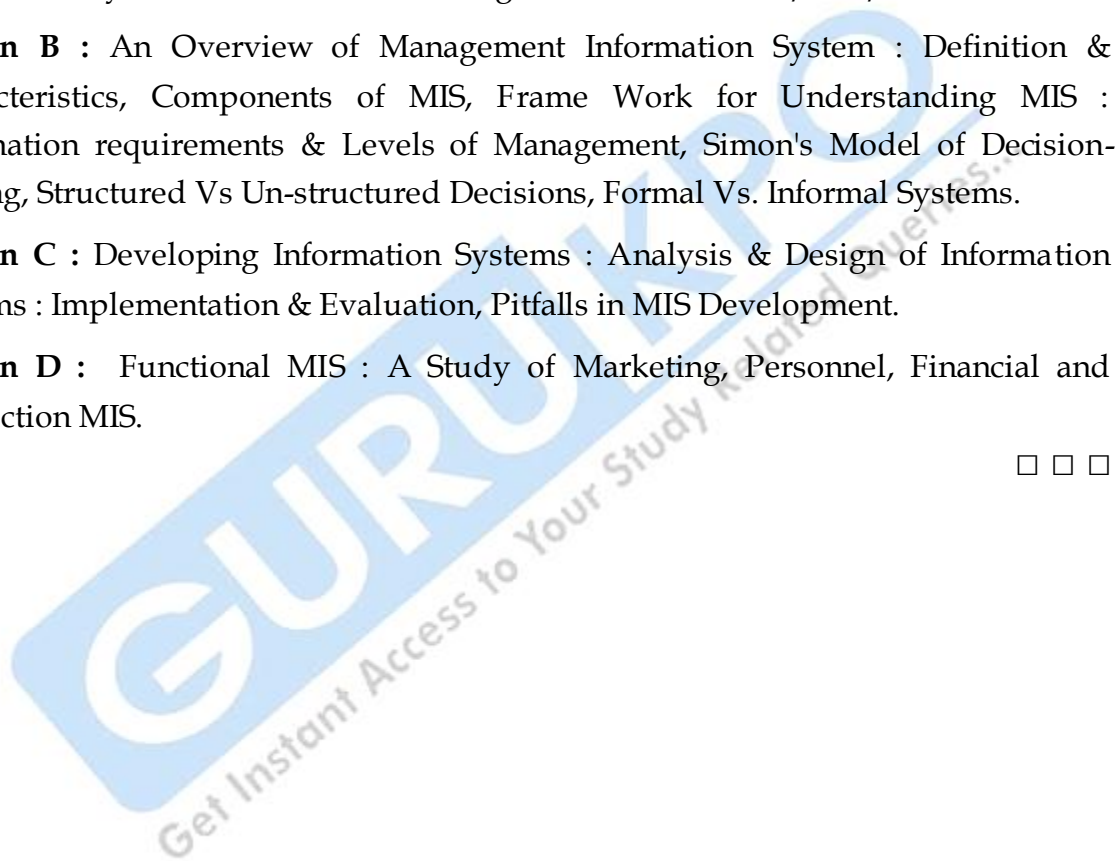
**Section A :** Introduction to System and Basic System Concepts, Types of Systems, The Systems Approach, Information System : Definition & Characteristics, Types of Information, Role of Information in Decision-Making, Sub-Systems of an Information System : EDP and MIS Management Levels, EDP/MIS/DSS

**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

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

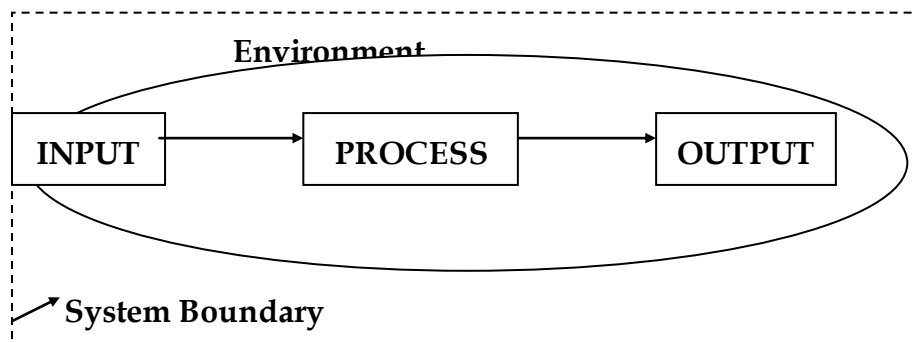
**Ans.:** The word system is derived from the Greek word “system” which means a organized relationship among the following unit or component.

*“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.





**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 )

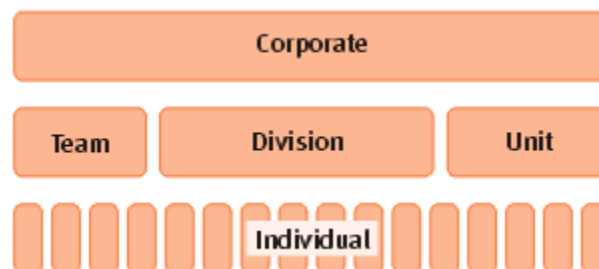
The needs of each of these three levels must be met if a coordinated and effective solution is to be maintained in the long-term.

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.

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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.



**Value of information = Cost to get information-benefit**

Given a set of possible decisions, a decision maker will select one on the basis of the available information. If the new information causes a change in the decision, then the value of information is the difference in the value between outcome of the old decision and that of new decision, less the cost obtaining the new information. The value of the additional information making the existing information perfect (VPI) is:

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

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 that those of operational control managers. It is because of the fact that managers at different levels are required to perform different functions in an organization.
- (iii) **Technical Dimension** : This dimension of information refers to the technical aspects of the database. It includes the capacity of database, response time, security, validity, data interrelationship etc.

**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 from various internal and external sources. These inputs are processed through the MIS to produce the desired output, which may be in turn used for different managerial tasks 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 tasks 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 Bauer, as the establishment and use of engineering principles 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 systems, which are developed and implemented to the desired 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

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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.

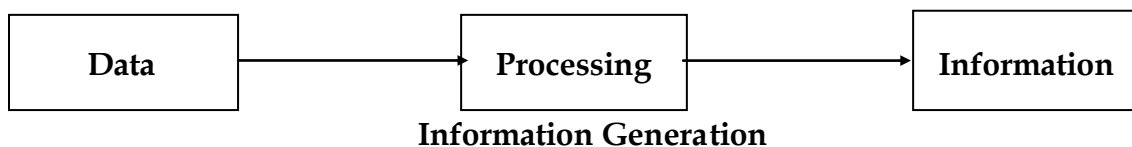
**Ans.:** Management Information Systems (MIS), referred to as Information Management and Systems, is the discipline covering the application of people, technologies, and procedures collectively called information systems, to solving business problems.

*"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.

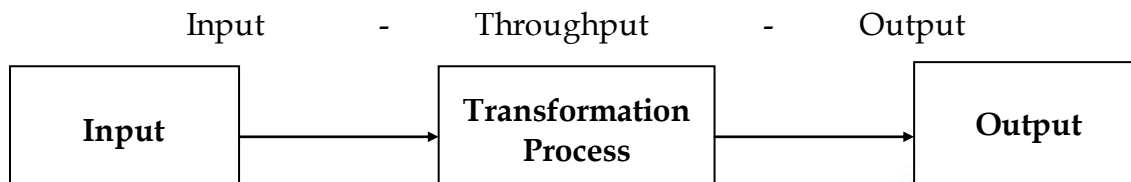
**Management** : Management is art of getting things done through and with the people in formally organized groups. The basic functions performed by a manager in an organization are: Planning, controlling, staffing, organizing, and directing.

**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.



**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.

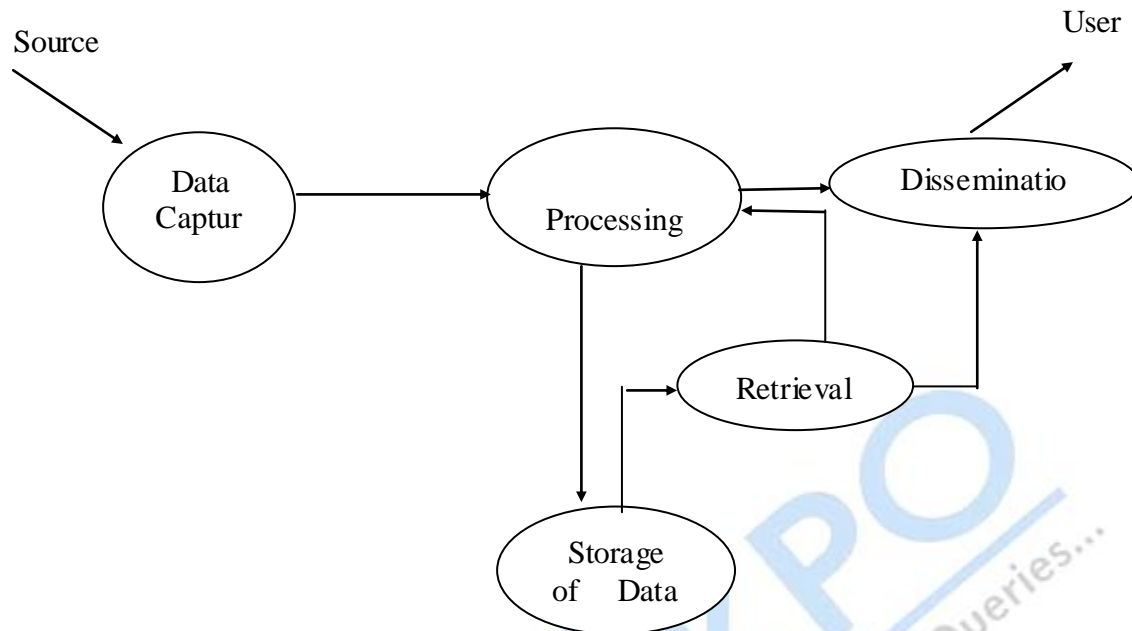
**Processing of Data :** The captured data is processed to convert into required information. Processing of data is done by such activities as calculating, sorting, classifying, and summarizing.

**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 “ programmes” 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 :**

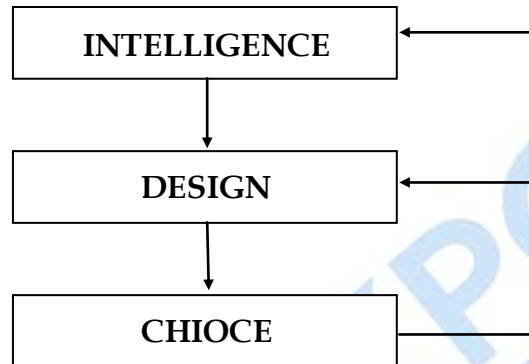
- i) Support for decision makers in semi structured and unstructured problems.
- ii) Support managers at all levels.
- iii) Support individuals and groups.
- iv) Support for interdependent or sequential decisions.
- v) Support intelligence, design, choice, and implementation.
- vi) Support variety of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

- i) **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.
- ii) **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 :**

- i) **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.
- ii) **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.
- iii) **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.
- iv) **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**

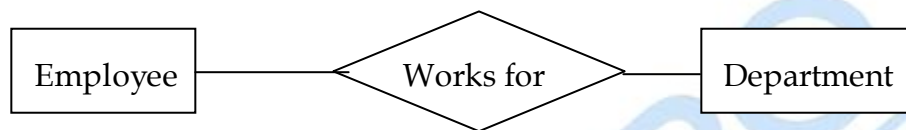
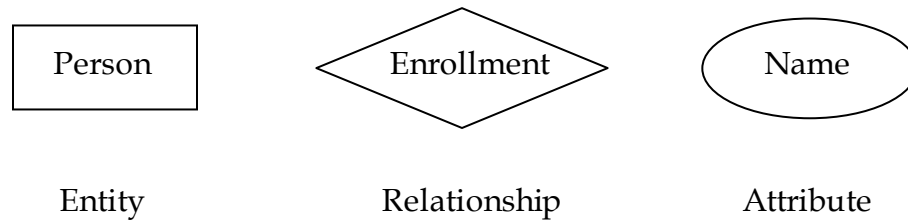
**What are the different tools for the System Analysis?**

**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.

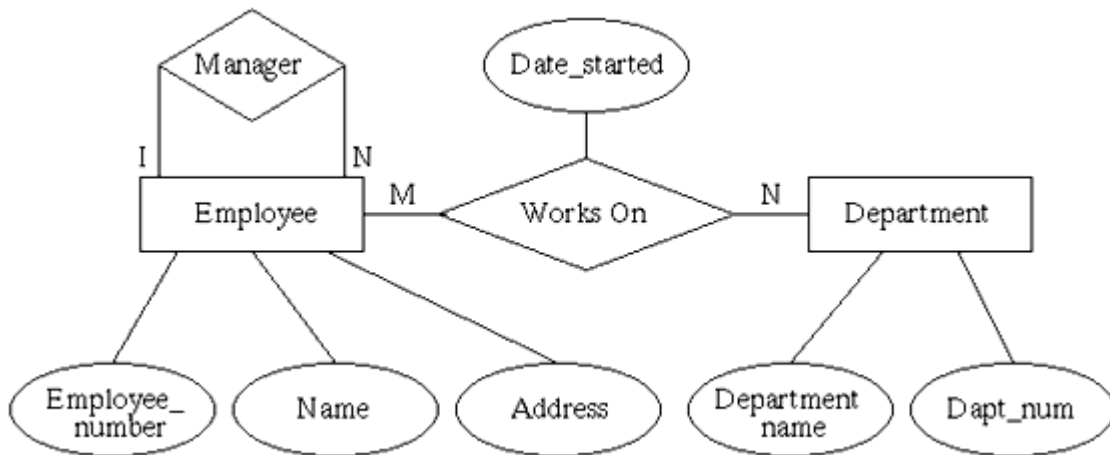
A relationship captures how two or more entities are related to one another. Examples: an *owns* relationship between a company and a computer, a *supervises* relationship between an employee and a department, a *performs* relationship between an artist and a song. Relationships are represented as diamonds, 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
<b>Age &gt; 21</b>	Y	Y	Y	Y	N	N	N	N
<b>Sex</b>	M	M	F	F	M	M	F	F
<b>Weight &gt; 150</b>	Y	N	Y	N	Y	N	Y	N
<b>Medication 1</b>	X				X			X
<b>Medication 2</b>		X			X			
<b>Medication 3</b>			X			X		X
<b>No medication</b>				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}**

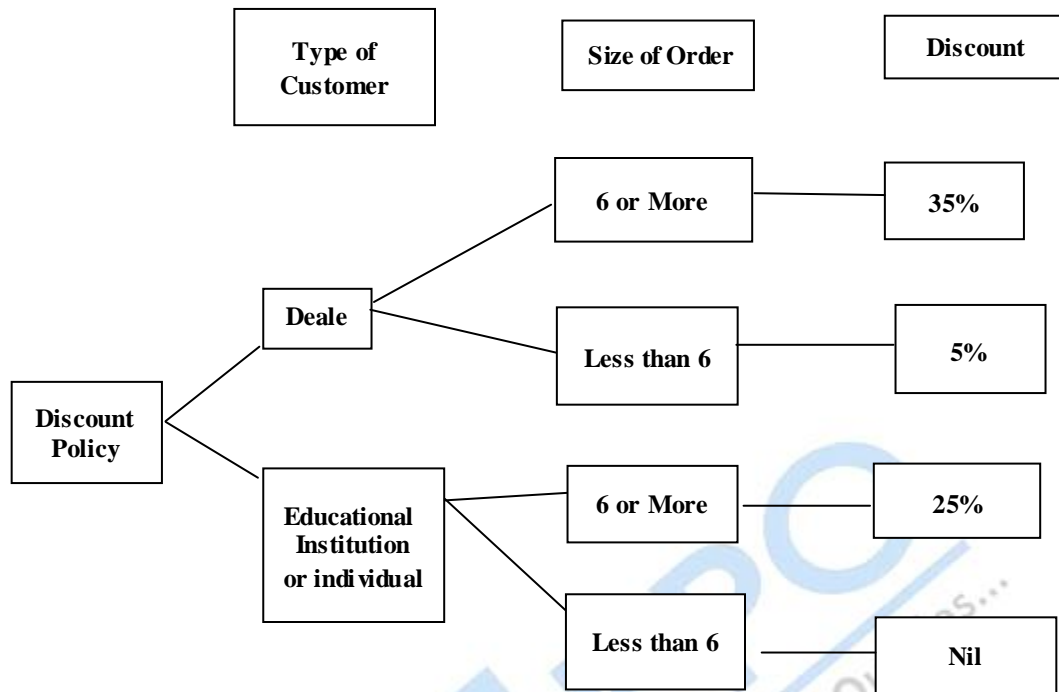
**middle-name = {legal-character}**

**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
	Computational steps or processing function of a program
	Input or output operation
	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 :**

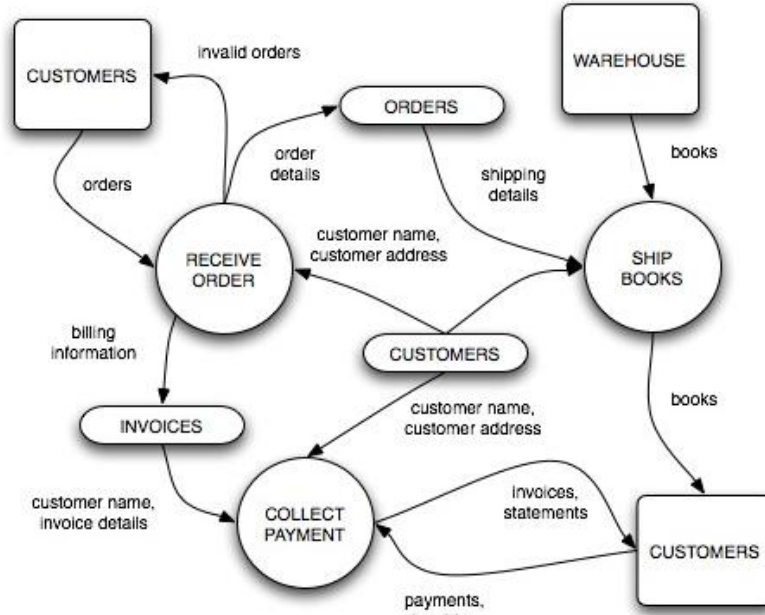
- i) **Complex Logic** : Sometimes, the program logic is quite complicated. In that case, flowchart becomes complex and clumsy.
- ii) **Alterations and Modifications** : If alterations are required the flowchart may require re-drawing completely.
- iii) **Reproduction** : As the flowchart symbols cannot 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,

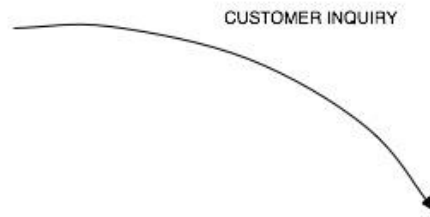


**Process**

**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 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.

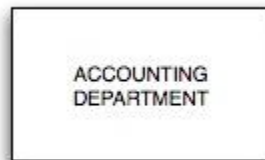
A flow from store is often described as a read.

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.*

- iv) **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. **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 or 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 changes correct errors and adapt 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

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**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.
- (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 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 collected 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 develops 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 file s 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 delays 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 verses 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 Revenues Costs &	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.

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 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** :
- ( $\alpha$ ) **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.
  - ( $\beta$ ) **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.

## Chapter-4

# Functional MIS

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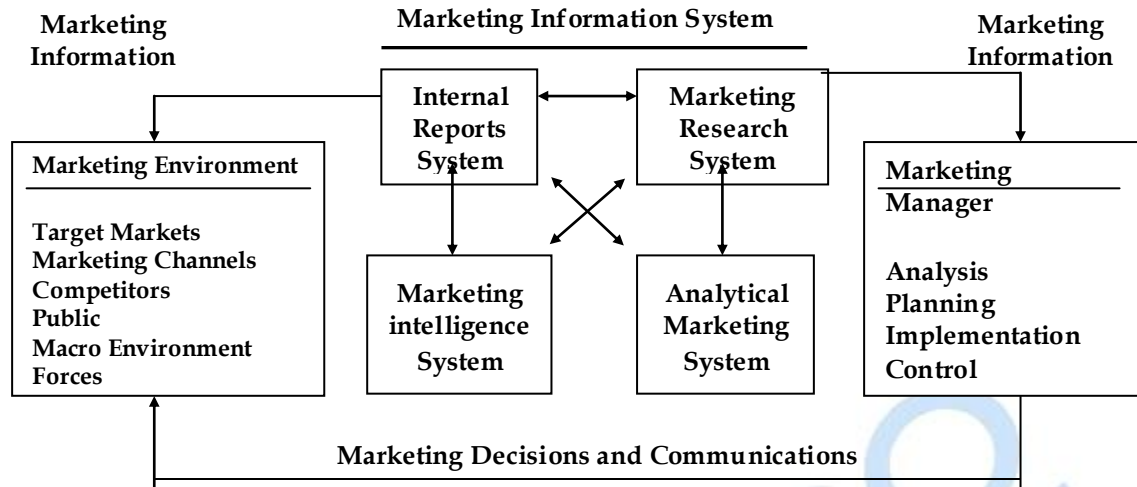
**Q.1 Write short notes on MIS for Finance, MIS for Marketing, MIS for Production, MIS for HRM.**

**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.





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 employees 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 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 :**

- Receipts from customers, authorities, employees, share holders, financial institution and others.
- Payment to suppliers, authorities, share holders, financial institutions and others.
- 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.

□ □ □

**BACHELOR OF COMPUTER APPLICATIONS****(Part III) EXAMINATION****(Faculty of Science)****(Three - Year Scheme of 10+2+3 Pattern)****PAPER 315****MANAGEMENT INFORMATION SYSTEM****OBJECTIVE PART- I****Year - 2011*****Time allowed : One Hour******Maximum Marks : 20***

**The question paper contains 40 multiple choice questions with four choices and students will have to pick the correct one (each carrying ½ mark).**

1. .... is the part of a much larger organizational information system.  
(a) Data  
(b) Information  
(c) Database System  
(d) None of the above ( )
2. The element of MIS are :  
(a) Management  
(b) System  
(c) Information  
(d) All of the above ( )
3. Which one of the following is not a top management function?  
(a) Planning (b) Organising  
(c) Decision-making (d) day to day operations ( )
4. What is management?  
(a) An Art  
(b) A Science  
(c) Both (a) and (b)  
(d) Neither (a) nor (b) ( )
5. .... tailored to the strategic information needs of top management.  
(a) TPS (b) EIS  
(c) KMS (d) Assistance ( )

6. Logical classification of data and information is :  
(a) Browsability  
(b) Readability  
(c) Searchability  
(d) Assistance ( )
7. An information system that responds immediately to the needs of the physical system is called :  
(a) In-line system  
(b) On-line system  
(c) Real time system  
(d) Nnone of the above ( )
8. In a passenger reservation system, which of the following is the most critical?  
(a) Ease of programming  
(b) Response time  
(c) GUI  
(d) None of the above ( )
9. An MIS may provide :  
(a) Past information  
(b) Present Information  
(c) Future information  
(d) All of the above ( )
10. The computer based information system does not include :  
(a) Input  
(b) Processor  
(c) Storge  
(d) Program for instructing the user ( )
11. Data is derived from latin word 'datum' which means :  
(a) That which is taken  
(b) That which is given  
(c) Extra-ordinary  
(d) None of the above ( )
12. Which is among is a characteristic of information?  
(a) It reduces uncertainty  
(b) Aids in accurate decision-making  
(c) Has a surprise value  
(d) All of the abobe ( )
13. The full form of 'JAD' is :  
(a) Joint Application Design

- (b) Jump Add-on Design  
(c) Joint Add-on Design  
(d) Jump Application Design ( )
14. ....is exploring ideas before invest in them.  
(a) JAD  
(b) Prototyping  
(c) Information  
(d) Data ( )
15. Which is not a valid data collection method?  
(a) Interviews  
(b) Questionnaires  
(c) Record review  
(d) All are valid ( )
16. VOI means :  
(a) Voice of information  
(b) Value of information  
(c) Value of Instance  
(d) None of the above ( )
17. RAD is variation of :  
(a) Prototyping  
(b) Waterfall model  
(c) Spiral model  
(d) None of the above ( )
18. Spiral model was design to include best features from the.....models.  
(a) Waterfall and RAD  
(b) Waterfall and prototyping  
(c) Prototyping and RAD  
(d) None of the above ( )
19. ....shows how data moves through an information system but does not show program logic.  
(a) DFD (b) Structured charts  
(c) Decision tables (d) Decision tree ( )
20. Two main symbol sets of DFDs are :  
(a) Gane and Sarson, Yourdon  
(b) Yourdon, Smith  
(c) Korth, Yourdon  
(d) None of the above ( )

21. Steps in project planning are :  
(a) Setting system objectives  
(b) Defining project tasks  
(c) Budget and work scheduling  
(d) All of the above ( )
22. Balanced MIS approach lays emphasis on :  
(a) Efficiency  
(b) Effectiveness  
(c) Both (a) & (b)  
(d) None of the above ( )
23. CBA stands for :  
(a) Cost Balanced Assessment  
(b) Cost-Benefit Assessment  
(c) Cost-Benefit Analysis  
(d) None of the above ( )
24. Purchase of hardware is an example of :  
(a) Intangible cost (b) Tangible benefit  
(c) Tangible cost (d) Intangible benefit ( )
25. Maintenance of MIS may be applied to which activity/condition :  
(a) Change in report format  
(b) Change in technology  
(c) Change in manager  
(d) Both (a) and (b) ( )
26. To run old and new system at the same time for a specified time period, this approach is known as :  
(a) Parallel (b) Pilot  
(c) Phased (d) Direct cut ( )
27. PERT and CPM are :  
(a) Network techniques  
(b) Assignment techniques  
(c) Project evaluation techniques  
(d) All of the above ( )
28. Decisions can be of :  
(a) Structured  
(b) Semi-structured  
(c) Un-structured  
(d) All of the above ( )



29. DSS is used for :  
(a) Structured decisions  
(b) Unstructured Decision  
(c) both (a) and (b)  
(d) None of the above ( )
30. In.....type of decision-making, both the leader and subordinate work together to arrive as a decision.  
(a) Facilitative  
(b) Authoritative  
(c) Delegative  
(d) None of the above ( )
31. Which is among a valid type of decision-making?  
(a) Rational  
(b) Intuitive  
(c) Ultimate  
(d) All of the above ( )
32. Simon's decision-making model includes :  
(a) Intelligence phase  
(b) Design phase  
(c) Choice phase  
(d) All of the above ( )
33. What kind of decisions have been taken mostly by lower management?  
(a) Strategic decisions  
(b) Policy decisions  
(c) Operational decisions  
(d) All of the above ( )
34. FMIS stands for :  
(a) Financial Management Information System  
(b) Functional Motivational Information System  
(c) Financial Modification Information System  
(d) None of the above` ( )
35. MIS for production management keeps detail track record of :  
(a) Customer order (b) Finished goods stock  
(c) Production Schedule (d) All of the above ( )
36. MIS helps in :  
(a) Strategic planning (b) Operational control  
(c) Transaction processing (d) All of the above ( )

37. AI stands for :  
(a) Artificial Information  
(b) Artificial Intelligence  
(c) Absolute Information  
(d) Absolute Intelligence ( )
38. The role of MIS begins from :  
(a) Developing a software  
(b) Determining Information needs  
(c) Development of DBMS  
(d) Training to staff ( )
39. Qualities of information are :  
(a) Relevant and up-to-date  
(b) Accurate and timeliness  
(c) Reliable and easy to understand  
(d) All of the above ( )
40. The information generated at regular interval is called :  
(a) Recurring (b) Planning  
(c) Action (d) Factual ( )

**DESCRIPTIVE PART-II**

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**Year- 2011*****Time allowed : 2 Hours******Maximum Marks : 30*****Attempt any four descriptive types of questions out of the six. All questions carry 7½ marks each.**

- Q.1 What is MIS? Explain various components and objectives of MIS in detail.
- Q.2 Differentiate between :
- (a) Deterministic and Probabilistic Systems
  - (b) Closed and Open Systems
  - (c) Physical and Abstract Systems.
- Q.3 Define the terms Data, Information and Knowledge. Explain different characteristics and quantities of information.
- Q.4 Write a short note on system design and analysis.
- Q.5 Discuss the following :
- (a) Direct conversion
  - (b) Phased conversion
  - (c) Parallel operation.
- Q.6 Explain :
- (a) Types of Decisions
  - (b) Simon's model of decision-making
  - (c) Role of MIS for marketing.
-

**OBJECTIVE PART- I****Year - 2010***Time allowed : One Hour**Maximum Marks : 20*

**The question paper contains 40 multiple choice questions with four choices and students will have to pick the correct one (each carrying 1/2 marks).**

1. MIS means:
  - (a) Management information system
  - (b) Management integrated system
  - (c) My internet system
  - (d) Meaningful Information System( )
2. Analysis of data results in:
  - (a) The definition of structure
  - (b) Provision for manipulation of information
  - (c) Both a and b
  - (d) None of the above( )
3. MIS is a part of the formal information network in an organization:
  - (a) True
  - (b) False
  - (c) Can't say
  - (d) None of the above( )
4. MIS uses:
  - (a) Computers
  - (b) Communication
  - (c) Both a and b
  - (d) None of the above( )
5. The role of MIS in an organization is equivalent to the role of:
  - (a) Brain
  - (b) Eyes
  - (c) Heart
  - (d) None of the above( )
6. MIS helps in:
  - (a) Strategic Planning
  - (b) Management and Operation Control
  - (c) Transaction Processing
  - (d) All of the above( )
7. Simon's helps in:
  - (a) Decision Making
  - (b) Operations

- (c) Management  
(d) None of the above ( )
8. Decision to set up a new factory is a:  
(a) Programmed Decision  
(b) Non-Programmed Decision  
(c) Semi Programmed Decision  
(d) None of the above ( )
9. A balanced expenditure on hardware and software will increase the chance of successful implementation of MIS:  
(a) True  
(b) False  
(c) Can't say  
(d) None of the above ( )
10. The conditions immediately outside a system is known as:  
(a) The environment (b) The boundary  
(c) The interface (d) None of the above ( )
11. Which of the not the part of a system:  
(a) Input  
(b) Output  
(c) Process  
(d) Environment ( )
12. When there is a specific relationship between inputs and outputs, the system is known as:  
(a) Open (b) Closed  
(c) Deterministic (d) Environment ( )
13. An information system always:  
(a) Transforms inputs to information  
(b) Requires hardware even if only pencil  
(c) Is Computer and Document based  
(d) All of the above ( )
14. What is concerned with the maximization of a firm's earnings after taxes?  
(a) Share holder wealth maximization  
(b) Stakeholder maximization  
(c) Profit maximization  
(d) EPS maximization ( )
15. Post installation audit assures that:  
(a) Manager's information need are being meet



- (b) The system to upto the mark  
(c) Both a and b  
(d) None of the above ( )
16. DSS stands for:  
(a) Direct Support System  
(b) Decision Support system  
(c) Document Support System  
(d) All of the above ( )
17. Basic components of dSS are:  
(a) The database (b) A model base  
(c) DSS software system (d) All of the above ( )
18. Graphic representation of a sequence of decisions and action is known as:  
(a) Flow Chart (b) E-R Diagram  
(c) Decision Tree (d) Decision Table ( )
19. Which of the dimension of information?  
(a) Economic (b) Business  
(c) Technical (d) All of the above ( )
20. The literal meaning of feasibility is:  
(a) Availability (b) Viability  
(c) Compatibility (d) None of the above ( )
21. Which is the type of system maintenance?  
(a) Perfective (b) Preventive  
(c) Emergency (d) All of the above ( )
22. Structured English uses:  
(a) Logical Constructions  
(b) Imperative sentences  
(c) Both a and b  
(d) None of the above ( )
23. Application of computer and communication technology in office functions is:  
(a) OAS  
(b) DSS  
(c) MIS  
(d) None of the above ( )
24. Business expert systems are specifically based on:  
(a) Software Engineering (b) Artificial Intelligence  
(c) Numerical Analysis (d) Automate Theory ( )

25. Which of the function of Financial System?  
(a) Controlling the receipts records (b) Maintaining statutory records  
(c) Numerical analysis (d) All of the above ( )
26. Information used in short term planning which is used for management control level is the:  
(a) Tactical Information (b) Strategic Information  
(c) Operational Information (d) None of the above ( )
27. In which way MIS is supervision EDP?  
(a) It is batch oriented  
(b) It is cost effective  
(c) It provides summary reports  
(d) None of the above ( )
28. Firewall is a :  
(a) Hardware  
(b) Software  
(c) Both a and b  
(d) None of the above ( )
29. Which of the component of MIS?  
(a) Hardware  
(b) Software  
(c) Both a and b  
(d) None of the above ( )
30. Main approach to MIS development is:  
(a) Prototype approach  
(b) Life cycle approach  
(c) Both a and b  
(d) None of the above ( )
31. The first stage of development of MIS is:  
(a) Identification of business process that are the essence of the business  
(b) Availability of computers to all managers  
(c) Purchase of computers  
(d) None of the above ( )
32. The MIS structure with one main computer system is known as:  
(a) Distributed MIS structure  
(b) Centralized MIS structure  
(c) Decentralized MIS structure  
(d) Hierarchical MIS structure ( )
33. Which of the step of decision making?

- (a) Determine existence of problem and/or opportunities
  - (b) Generate Alternative course of action
  - (c) Analyze/choose/select a course of action
  - (d) All of the above ( )
34. Status Enquiry system is a :
- (a) TPS (b) EDP
  - (c) DSS (d) AI ( )
35. Which is the example of Expert System Application:
- (a) Aerospace Technology (b) Criminology
  - (c) Health Care Management (d) All of the above ( )
36. Which of not method of designing a Information System ?
- (a) Build and Fix (b) Problem Partitioning
  - (c) Top Down Design (d) Logical and Physical Design ( )
37. Steps in Project Planning are:
- (a) Setting System objectives
  - (b) Defining project task
  - (c) Schedule the work and establishes a budget
  - (d) All of the above ( )
38. Which of the not the element of Learning Process?
- (a) Drive (b) Test
  - (c) Response (d) Reinforcement ( )
39. Choose the best option for implementation new system in an organization:
- (a) Cut off the old system and install the new one
  - (b) Use Segmentation Approach
  - (c) Parallel implementation
  - (d) All of the above ( )
40. Logical model is used as a basis for computing that generate information useful in dealing with:
- (a) Uncertain situations (b) Complex situation
  - (c) Dynamic situation (d) All of the above ( )

**Answer Key**

1. (a)	2. (c)	3. (a)	4. (c)	5. (a)	6. (d)	7. (a)	8. (a)	9. (a)	10. (a)
11. (d)	12. (c)	13. (a)	14. (c)	15. (c)	16. (b)	17. (d)	18. (c)	19. (d)	20. (b)
21. (d)	22. (c)	23. (c)	24. (b)	25. (d)	26. (c)	27. (c)	28. (b)	29. (d)	30. (c)
31. (a)	32. (b)	33. (d)	34. (a)	35. (d)	36. (d)	37. (d)	38. (a)	39. (c)	40. (d)

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**DESCRIPTIVE PART-II**

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**Year- 2010***Time allowed : 2 Hours**Maximum Marks : 30*

**Attempt any four descriptive types of questions out of the six. All questions carry 7½ marks each.**

- Q.1 (a) Differentiate between data and information  
(b) Discuss various types of information. Elaborate on their uses.
- Q.2 (a) A system is not a randomly arranged set. do you agree with this statement? Justify your answer.  
(b) Write a comparative note on EDP, MIS and DSS.
- Q.3 (a) What are the various elements of MIS?  
(b) What is impact of MIS on an organization's function, performance and productivity?
- Q.4 (a) Differentiate between Decision and Decision making process.  
(b) What are the variou tools of decision making? Explain them.
- Q.5 (a) Discuss and illustrate the main strategies for eliciting information about the user's requirement. Which strategy would you like to select?  
(b) Elaborate the symbols used in constructing DFDs.
- Q.6 Write notes on the following  
(a) Use of MIS in Finance  
(b) Threats of Information systems
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**OBJECTIVE PART- I**

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**Year - 2009*****Time allowed : One Hour******Maximum Marks : 20*****The question paper contains 40 multiple choice questions with four choices and student will have to pick the correct one (each carrying ½ mark).**

1. The basis in information in any organization is:  
(a) Data  
(b) Information  
(c) Hardware  
(d) None of the above ( )
2. Which one of the following activities is required in information system:  
(a) Collection of data  
(b) Management  
(c) Use of Hardware  
(d) All of the above ( )
3. ....is the part of much larger organization information system:  
(a) Data  
(b) Information  
(c) Database system  
(d) None of the above ( )
4. EDP means:  
(a) Electronic Data Procuring  
(b) Electronic Distributed Processing  
(c) Electronic Data Processing  
(d) None of the above ( )
5. Management describes what manager do in the operation of their organization:  
(a) Plan (b) Initiate  
(c) Control (d) All of the above ( )
6. A/An .....can be described simply as a set of element jointed together for a common objective:  
(a) Information  
(b) System  
(c) Data  
(d) None of the above ( )



7. DSS means:  
(a) Direct Support System  
(b) Decision Support System  
(c) Data Support System  
(d) None of the above ( )
8. Which one not a part of MIS?  
(a) DBMS  
(b) Networking  
(c) Top management  
(d) None of the above ( )
9. MIS aims to fulfill the organization needs of:  
(a) Operational staff  
(b) Top management  
(c) Middle management  
(d) All of the above ( )
10. MIS can be linked to the disciplines:  
(a) Management Accounting  
(b) Management and organization theory  
(c) Management Science  
(d) All of the above ( )
11. The elements of MIS are:  
(a) Management  
(b) System  
(c) Information ( )
12. A/An.....is a set of components that operate together to achieve a common objective or multiple objectives:  
(a) Information  
(b) Management  
(c) Physical System  
(d) None of the above ( )
13. Which of the following is characteristic of information in MIS:  
(a) Repetitiveness  
(b) Great Accuracy  
(c) Predictability  
(d) All of the above ( )
14. Basic requirements of MIS are:  
(a) Hardware  
(b) Software

- (c) Database  
(d) All of the above ( )
15. ....is concerned with determining maintaining and supplying information required by top level management.  
(a) Strategic information level  
(b) Tactical information level  
(c) Operational information level  
(d) None of the above ( )
16. ....is consolidation of many files, which contain to data of the organization:  
(a) System  
(b) Database  
(c) Management  
(d) None of the above ( )
17. A computer system that combines data, analytical, tools, user-friendly software to support decision making at the management level is called:  
(a) MIS  
(b) DSS  
(c) Data Processing  
(d) None of the above ( )
18. Which one is not a system development tool?  
(a) DFD  
(b) System Component Matrix  
(c) System Flow charts  
(d) OOP ( )
19. ....meets the information requirement of the middle level of management:  
(a) Strategic information level  
(b) Tactical information level  
(c) Operational information level  
(d) None of the above ( )
20. The role of MIS begins from:  
(a) Developing a software  
(b) Developing a good DBMS  
(c) Determining information needs  
(d) Training staff for effective working ( )
21. Which factor enhanced the importance of MIS?  
(a) Dynamic and competitive nature of market place  
(b) Lack of subject expertise

- (c) Nature disasters  
(d) All of the above ( )
22. Good documentation means:  
(a) proper maintenance and development of data dictionaries, flowcharts, ERD, system logics and comment  
(b) Well maintained organizational file structures to preserve efficiency in operational tasks  
(c) Using better quality papers and documents that can be stored long lasting safely  
(d) None of the above ( )
23. ....is one of the oldest and most traditional methods for developing information systems:  
(a) System development life cycle  
(b) System maintenance  
(c) System analysis  
(d) None of the above ( )
24. MIS support decision making in:  
(a) Structure Environment (b) unstructured environment  
(c) Both a and b (d) None of the above ( )
25. MIS are made of:  
(a) People  
(b) Computers  
(c) Databases  
(d) All of the above ( )
26. ....in charge or all activities of the section:  
(a) System analyst (b) System Analyst  
(c) System manager (d) None of the above ( )
27. ....competent to work at the highest level of all technical phases of the activity while working on his own most of the time:  
(a) Programmer  
(b) System analyst  
(c) Data entry operator  
(d) None of the above ( )
28. Which one is not a part of system development process?  
(a) Embedded  
(b) Timeliness  
(c) Relevant  
(d) Action oriented ( )

29. Which one is not a part of system development process?  
(a) Testing  
(b) Requirement analysis  
(c) Total Quality Management  
(d) Implementation ( )
30. Which are techniques of management?  
(a) Behavioural Science Techniques  
(b) Decision Techniques  
(c) Quantitative Techniques  
(d) All of the above ( )
31. Functions of management are:  
(a) Planning  
(b) Directing  
(c) Staffing  
(d) All of the above ( )
32. CAD is mainly used in:  
(a) Database design  
(b) Manufacturing design  
(c) System analysis and design  
(d) None of the above ( )
33. A.....provider a picture of a sequence of activities:  
(a) Flowcharts  
(b) Decision Table  
(c) Simulation  
(d) None of the above ( )
34. A well-defined MIS provides information to all level of management for:  
(a) To define the objective of the organization  
(b) To develop training tools  
(c) To prepare future plans  
(d) All of the above ( )
35. Decision tables links conditions and:  
(a) Programs (b) Actions  
(c) Data (d) Tables ( )
36. MIS uses.....to generate important information:  
(a) Database  
(b) Flowcharts  
(c) Os application

- (d) Networks ( )
37. Which one of the following is not a sources of information:  
 (a) Internet  
 (b) Interviews  
 (c) Factories  
 (d) Survey ( )
38. Structure of a MIS can be described in the:  
 (a) Functional from  
 (b) MIS at different levels  
 (c) Comprehensive structure of MIS  
 (d) All of the above ( )
39. The word 'MIS' includes:  
 (a) Management of information  
 (b) Information of system  
 (c) System Management  
 (d) All of the above ( )
40. For strategic decision the MIS plays a role of .....to top management:  
 (a) Data provider  
 (b) Decision supporter  
 (c) Decision maker  
 (d) Decision analyst ( )

**Answer Key**

1. (a)	2. (d)	3. (c)	4. (c)	5. (d)	6. (b)	7. (b)	8. (d)	9. (d)	10. (d)
11. (d)	12. (d)	13. (d)	14. (d)	15. (b)	16. (b)	17. (b)	18. (d)	19. (b)	20. (c)
21. (d)	22. (a)	23. (a)	24. (c)	25. (d)	26. (c)	27. (b)	28. (a)	29. (c)	30. (d)
31. (d)	32. (b)	33. (a)	34. (d)	35. (b)	36. (a)	37. (c)	38. (d)	39. (a)	40. (b)



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**DESCRIPTIVE PART - II**

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**Year 2009***Time allowed : 2 Hours**Maximum Marks : 30***Attempt any four questions out of the six. All questions carry 7½ marks each.**

- Q.1 Define an MIS and discuss its objective and characteristics.
- Q.2 (a) Differentiate between MIS and Decision support system.  
(b) Explain the role of information in Decision making.
- Q.3 (a) Explain the Simon's model of decision making?  
(b) Differentiate between formal and informal system.
- Q.4 (a) What is system? Discuss different types of systems.  
(b) Differentiate between structured and unstructured decisions.
- Q.5 Write short notes on:  
(i) EDP  
(ii) Components of MIS
- Q.6 (a) What is Information System? Discuss the various phases of Developing information systems.  
(b) Write a note on Functional MIS.
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**OBJECTIVE PART- I**

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**Year - 2008****Time allowed : One Hour****Maximum Marks : 20****The question paper contains 40 multiple choice questions with four choices and student will have to pick the correct one (each carrying ½ mark).**

1. The word 'MIS' includes:
  - (a) Management of Information
  - (b) Information of System
  - (c) System Management
  - (d) All of the above( )
2. Which one of the following is not a characteristic of information:
  - (a) Embedded
  - (b) Timelines
  - (c) Relevant
  - (d) Action oriented( )
3. Which one is not a part of System Development Process:
  - (a) Testing
  - (b) Requirement analysis
  - (c) Total Quality Management
  - (d) Implementation( )
4. Which one of the following statement is correct:
  - (a) The study of MIS is about the use of computers
  - (b) More data means more information for managers
  - (c) MIS is made to support the lower management
  - (d) MIS is not a complete substitute for effective management( )
5. Which level of management needs detailed information the most:
  - (a) Lower Management
  - (b) Middle Management
  - (c) Top Management
  - (d) They all need it equally( )
6. Which entity is not related to the definition of system:
  - (a) Input
  - (b) Output
  - (c) Process

- (d) None of the above ( )
7. What kind of feasibility is not checked during system development:  
(a) Economic feasibility  
(b) Market feasibility  
(c) Technical feasibility  
(d) Operational feasibility ( )
8. In which type of implementation, the new system is introduced at one location or site only for trial:  
(a) Phase  
(b) Parallel  
(c) Plunge (cut off)  
(d) Pilot ( )
9. Metadata is included in:  
(a) Data dictionary  
(b) Database backup  
(c) Meta-large data terminals  
(d) Network protocols ( )
10. In context of MIS, EDP stands of:  
(a) Entrepreneurship Development Program  
(b) Electronic Data Preparations  
(c) Electronic Data Planning  
(d) Electronic Data Processing ( )
11. CAD is mainly used in:  
(a) Database design  
(b) Manufacturing design  
(c) System analysis and design  
(d) None of the above ( )
12. Which one of the following is the basic management function:  
(a) Planning  
(b) Organizing  
(c) Controlling  
(d) All of the above ( )
13. What could be the challenge in front of MIS implementation:  
(a) Finding the experts  
(b) Finding Latest Computers  
(c) Finding social acceptance  
(d) All of the above ( )

14. Feasibility study may not include the study of:  
(a) Manpower  
(b) Technology  
(c) Finance/Economy  
(d) Customers ( )
15. The system which interacts with its environment is called:  
(a) Natural system  
(b) Open System  
(c) Closed system  
(d) Deterministic system ( )
16. Which one of the following is not a source of information:  
(a) Internet  
(b) Interviews  
(c) Factories  
(d) Survey ( )
17. Source of data stored could be displaced graphically in:  
(a) DFD  
(b) ERD  
(c) Data Dictionary  
(d) Both a and b ( )
18. Which one of not a part of MIS:  
(a) DBMS  
(b) Networking  
(c) Top Management  
(d) None of the above ( )
19. What kind of decisions have been taken mostly by lower management :  
(a) Strategic decisions  
(b) Policy decisions  
(c) Operational decision  
(d) None of the above ( )
20. Which one is not a system development tool:  
(a) DFD  
(b) OOP  
(c) System Component Matrix  
(d) System Flow Charts ( )
21. MIS is not:  
(a) Quantity Oriented (b) Report Oriented  
(c) Action Oriented (d) End User Oriented ( )

22. Which factor enhanced the importance of MIS:
- (a) Dynamic and competitive nature of market place
  - (b) Lack of subject expertise
  - (c) Natural Disasters
  - (d) All of the above
- ( )
23. The role of MIS begins from:
- (a) Developing a software
  - (b) Determining information needs
  - (c) Developing good DBMS
  - (d) Training staff for effective working
- ( )
24. The evolution of MIS should be made by designers as well as by.....
- (a) Competitors
  - (b) Customers
  - (c) Industrialists
  - (d) Govt. Offices
- ( )
25. Good Documentation Means:
- (a) Proper maintenance and development of data dictionaries, flowcharts, ERD, system logics and comments
  - (b) Well maintained organizational file structures to preserve efficiency in operational tasks
  - (c) Using better quality papers and documents that can be stored long lasting safely
  - (d) None of the above
- ( )
26. Maintenance of MIS may be applied to which activity/conditions:
- (a) Change in Reports
  - (b) Change in Technology
  - (c) Change in Managers
  - (d) a and b both
- ( )
27. For strategic decision the MIS plays a role of.....to top management:
- (a) Data provider
  - (b) Decision supporter
  - (c) Decision maker
  - (d) Decision analyst
- ( )
28. In contrast to accounting systems, financial systems, ensure:
- (a) Appropriate organizational funding at a low cost so as to maximize returns to share holders
  - (b) The recording, classifying, summarizing transaction and events in a significant manner and in terms of money
  - (c) Proper management of financial statement such as Balance Sheet profit and loss A/c statement etc.



- (d) There is no difference between both the system ( )
29. Which one of the following system crucially requires earliest response time:  
(a) Railway Reservation System  
(b) Air traffic Control System  
(c) customer care system  
(d) All of the above need same response time ( )
30. MIS aims to fulfil the organizational needs of:  
(a) Operational staff (b) Top management  
(c) Middle management (d) All of the above ( )
31. MIS uses.....to generate important information:  
(a) Database (b) Flowcharts  
(c) OS application (d) Networks ( )
32. Which one of the following is not directly do-related:  
(a) Marketing and survey  
(b) Human resources and CAM  
(c) Finance and Infrastructure  
(d) DSS and information ( )
33. Which one of the following is not an example of application of MIS in personnel functioning:  
(a) Customer care system (b) Payroll system  
(c) Employee information system  
(d) Training and development system ( )
34. What kind of hardware may be used for DB-backup:  
(a) Tap drive  
(b) ROM  
(c) RAM  
(d) EEPROM ( )
35. ....are usually set to fulfil short term but time and quantity specific targets:  
(a) Tape derive  
(b) ROM  
(c) RAM  
(d) EEPROM ( )
36. What is the key objective of system analysis:  
(a) Understanding working pattern of competitor's work force  
(b) Understanding computer hardware and networking

- (c) Understanding a system and its complexities for new setup development or modification
- (d) Train manager in mathematical analysis ( )
37. Decision tables link conditions and:
- (a) Program
- (b) Actions
- (c) Data
- (d) Tables ( )
38. Prototyping aims at:
- (a) Program logic
- (b) End user understanding and approval
- (c) Planning of data flow organization
- (d) None of the above ( )
39. Absence of 'Data Integrity' means:
- (a) Data is copied more than one time
- (b) Data is not suitable to run in an integrated environment
- (c) Data is time expired
- (d) Data is not consistent ( )
40. Which system encourages employee to give new idea and share his business experience within the organization
- (a) Expert system (b) Office automation system
- (c) Knowledge management system (d) Decision support system ( )

**Answer Key**

1. (d)	2. (a)	3. (c)	4. (c)	5. (a)	6. (d)	7. (b)	8. (d)	9. (a)	10. (d)
11. (b)	12. (b)	13. (c)	14. (d)	15. (b)	16. (c)	17. (a)	18. (b)	19. (c)	20. (b)
21. (a)	22. (d)	23. (b)	24. (b)	25. (a)	26. (d)	27. (b)	28. (c)	29. (b)	30. (d)
31. (a)	32. (b)	33. (d)	34. (a)	35. (c)	36. (c)	37. (b)	38. (b)	39. (d)	40. (c)

**DESCRIPTIVE PART – II**

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**Year 2008*****Time allowed : 2 Hours******Maximum Marks : 30*****Attempt any four questions out of the six. All questions carry 7½ marks each.**

- Q.1 (a) What do you understand by Management Information system? Explain the challenges and pitfalls in the development of MIS?  
(b) What kind of information are required for various levels of management in any organization? Provide diagrams to justify your answer.
- Q.2 How important is information requirement analysis in the development of effective MIS? Describe various methods of implementation for newly developed MIS at any organization.
- Q.3 (a) What is information? Explain its major characteristics and classification.  
(b) Explain the model of DSS given by Herbert Simon. How does MIS help DSS for better decision?
- Q.4 What do you mean by a word 'system'? Briefly describe various types of systems through suitable examples. How could you relate MIS with the concepts of the system?
- Q.5 SAI fragrances is an Indian multinational company having its own kind of deodorants. To improve overall working efficiency, the company wants to develop MIS for their newly computerized organization. Prepare a detailed functional plan for their "marketing management" MIS.
- Q.6 Write a short note on the following:  
(a) Structured v/s Unstructured Decision.  
(b) EDP.  
(c) Evaluation of Information System.  
(d) Formal v/s informal system.
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**OBJECTIVE PART- I**

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**Year - 2007*****Time allowed : One Hour******Maximum Marks : 20*****The question paper contains 40 multiple choice questions with four choices and student will have to pick the correct one (each carrying ½ mark).**

1. Which one of the following is not a top management function?
  - (a) Planning
  - (b) Organizing
  - (c) Decision making
  - (d) Day to day operations( )
  
2. Which of the following is not a part of MIS?
  - (a) Exception report for middle management
  - (b) Summary report for top management
  - (c) Action report for line management
  - (d) Payroll for workers( )
  
3. One line data entry is most suitable in the case of :
  - (a) Entering monthly monthly journal entries
  - (b) payroll master updation
  - (c) Processing payment of cheque in a bank
  - (d) None of the above( )
  
4. The basic objective of systems analysis is to:
  - (a) Understand computer hardware by opening the system unit
  - (b) Train managers in mathematical analysis
  - (c) Run simulation program
  - (d) Undetstand a complex system and modify it in some way( )
  
5. System quality relates to its:
  - (a) Reliability
  - (b) Efficiency
  - (c) Maintainability
  - (d) All of three above( )
  
6. The balance sheet of a company reflects:
  - (a) Its status at any given point of time
  - (b) Its performance during the course of the year
  - (c) Neither a nor b
  - (d) both a and b( )

7. The starting point for developing of an MIS is:  
(a) Purchase of a minicomputer  
(b) Providing PCs to all manager  
(c) Identification of the business processes that are the essence of the business  
(d) None of the above ( )
8. Ideally, the information system objectives, should be stated in the form of:  
(a) Increases product sales (b) Reduced marketing cost  
(c) Increased product x sales by 5% in the next quarter  
(d) All of the above ( )
9. Environment in systems parlance refers to:  
(a) A sub system  
(b) The boundary  
(c) A part outside the boundaries  
(d) None of the above ( )
10. Which of the following is not a level of information handling:  
(a) Decision Support System (DSS)  
(b) Operations Assistance System  
(c) Transaction Processing Ssystem (TPS)  
(d) Office Automation system ( )
11. An information system that responds immediately to the needs of the physical system is called in:  
(a) Inline system  
(b) On line system  
(c) Real time system  
(d) None of the above ( )
12. The system conversion technique of totally removing the existing system and immediately implementing the new system is called in:  
(a) Cresh Conversion (b) Phased Conversion  
(c) Pilot conversion (d) Parallel run ( )
13. Spoken message may be stored and forwarded by:  
(a) Voice Mail System (b) video conferencing  
(c) E-mail (d) Expert system ( )
14. In a supermarket, which of the following, will be found in use in its computerized system?  
(a) Scanner  
(b) bar code reader  
(c) POS terminal  
(d) All of the above ( )

15. Decision tables link conditions and:  
(a) Tables (b) programs  
(c) Actions (d) None of the above ( )
16. In a passenger reservation system, which of the following is the most critical?  
(a) Ease of programming  
(b) Response time  
(c) GUI  
(d) None of the above ( )
17. A data dictionary:  
(a) Gives the meaning of the data names used in the system  
(b) Defines the data types  
(c) Defines all data elements and structures used in DFD  
(d) None of the above ( )
18. A software design description document only includes:  
(a) Data dictionary (b) ER diagram  
(c) DFD (d) All of the above ( )
19. Backup and recovery procedure are necessary to:  
(a) Recognize the disk  
(b) Control the DBA  
(c) Handle contingencies like files getting corrupts or becoming irretrievable  
(d) None of the above ( )
20. The sequence of steps following in a system study is:  
(a) Problem definition, Systems Design, Systems Analysis, Programming and Implementing  
(b) System analysis, systems design and system implementation  
(d) Problem definition, system analysis systems design, programming and implementation ( )
21. Most important aspect of system design focus on:  
(a) Economics and technical feasibility  
(b) Operational feasibility  
(c) Developing end user information needs  
(d) All of the above ( )
22. The most important reason for failure of MIS is:  
(a) Use of improper tools for design  
(b) Non involvement of end users  
(c) Improper specification



- (d) None of the above ( )
23. To implement a MIS:
- (a) A computer is inescapable
  - (b) E-mail is required
  - (c) Proper system and procedure must be in place
  - (d) None of the above ( )
24. A parallel run involves :
- (a) Firing two different application from different terminals accessing a common database
  - (b) Compiling programs with two different languages
  - (c) The concurrent operation of the existing and newly developed system
  - (d) None of the above ( )
25. Schedule of Delivery' is an example of a :
- (a) Data processing system
  - (b) Transaction based system
  - (c) Decision support system
  - (d) None of the above ( )
26. Which of the following is a tactical decision?
- (a) Diversification
  - (b) Workshop location
  - (c) Budget allocation
  - (d) None of the above ( )
27. Select the most appropriate statement from the following:
- (a) Operational Managers make unstructured decisions
  - (b) Middle level managers undertake long range planning
  - (c) As the management level goes up the hierarchy, information becomes more and more summarized
  - (d) None of the above ( )
28. If the requirements analysis phase of a software development project is not done properly then file :
- (a) Resulting system would be delivered before time
  - (b) Output reports would be indecipherable
  - (c) System might fail to address the real needs of users
  - (d) All of the above ( )
29. Whether a proposed system can provide right information for the organization personnel, falls under the study of:
- (a) Economic feasibility
  - (b) Operational Feasibility
  - (c) Technical feasibility
  - (d) All of the above ( )
30. Managers in organization should not design their own systems as:

- (a) System have to interact with other systems  
(b) They do not have the special skills necessary to design systems  
(c) It is not their job  
(d) They are always very busy ( )
31. System evaluation is carried out:  
(a) After the system has been operational for a reasonable time  
(b) During system implementation  
(c) Whenever managers of user organization want it  
(d) Whenever operational staff want it ( )
32. A cost benefit analysis is performed as apart of:  
(a) System design  
(b) System specification  
(c) System performance assessment  
(d) Feasibility analysis ( )
33. The scope of the system test includes:  
(a) Both computerized and manual procedure  
(b) Only test of computer procedure  
(c) Computerized procedure, manual, procedure computer operations and controls  
(d) Mainly computerized procedure and operations controls ( )
34. Security in the design of information system is used to:  
(a) Inspect the system and check that it is build as per the specification  
(b) Protect data from accidental or intentional loss  
(c) Ensure that the system processes data as it was designed to and that the results are reliable  
(d) Ensure privacy of data processes by it ( )
35. Goals are identified by:  
(a) Finding the deficiencies in the current system  
(b) Observing the current system  
(c) Analyzing the competitor's system  
(d) Finding the advantages in the current system ( )
36. When is menu interface a convenient way of user interaction?  
(a) For data processing in a restaurant  
(b) When mouse is used as the main input device  
(c) When data has to be imported from a spreadsheet  
(d) When it is difficult for the user to remember all the options available and for typing in complicated commands ( )
37. 'CAM' is used in which industry?  
(a) Automobile (b) Helicopter

- (c) Three wheeler (d) All of the above ( )
38. Prototyping aims at:  
 (a) End user understanding and approval  
 (b) Program logic  
 (c) Planning of data flow originations  
 (d) None of the above ( )
39. Which of the following is not a tool of data collection ?  
 (a) On site observation (b) Flowcharts  
 (c) Interviews (d) Questionnaires ( )
40. Loss of data integrity implies that data is:  
 (a) Not suitable for running in an integrated environment  
 (b) Inconsistent  
 (c) Repeated  
 (d) Outdated ( )

**Answer Key**

1. (d)	2. (d)	3. (d)	4. (d)	5. (d)	6. (d)	7. (c)	8. (d)	9. (c)	10. (a)
11. (c)	12. (b)	13. (a)	14. (b)	15. (c)	16. (b)	17. (c)	18. (d)	19. (c)	20. (d)
21. (d)	22. (b)	23. (c)	24. (c)	25. (b)	26. (d)	27. (c)	28. (c)	29. (b)	30. (c)
31. (a)	32. (d)	33. (c)	34. (c)	35. (a)	36. (b)	37. (d)	38. (d)	39. (b)	40. (a)

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**DESCRIPTIVE PART - II**

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**Year 2007***Time allowed : 2 Hours**Maximum Marks : 30***Attempt any four questions out of the six. All questions carry 7½ marks each.**

- Q.1 (a) What is understood by the term MIS? How does it assist managers in their day to day functioning?  
(b) With the help of a suitable example, explain the concept of DSS.
- Q.2 (a) Explain various types of information.  
(b) What is meant by the word 'System' ? Explain different kinds of systems.
- Q.3 (a) Differentiate various types of information.  
(b) What is meant by the word 'System? Explain different kinds of systems.
- Q.4 (a) What is meant by system analysis? Briefly describe the main objectives of system analysis.  
(b) What is meant by conceptual design of MIS?
- Q.5 (a) Why is evaluation of MIS important?  
(b) Why is system maintenance necessary? Explain the types of system maintenance.
- Q.6 (a) Why is computerization of the accounting function often the first area that is first automated and what are the advantages in computerizing these functions?  
(b) How are EDP systems better than manual or mechanical information systems?
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**OBJECTIVE PART- I****Year - 2006****Time allowed : One Hour****Maximum Marks : 20****The question paper contains 40 multiple choice questions with four choices and student will have to pick the correct one (each carrying ½ mark).**

1. A system analyst designs a new system by:
  - (a) Adopting a developed system to the present environment
  - (b) Developing the system as a large, single unit
  - (c) Identifying subsystems and interfaces between subsystems
  - (d) None of the above( )
2. A feasibility study:
  - (a) Includes a statement of the problem
  - (b) Considers a single solution
  - (c) None of the above
  - (d) both a and b( )
3. In top down analysis and design:
  - (a) Each succeeding phase is more detailed than the phase before it.
  - (b) Each succeeding phase is less detailed than the phase before it.
  - (c) Each succeeding phase is as detailed as the phase before it.
  - (d) None of the above( )
4. Which of the following is a medium for transporting the output of a system of the input of another system?
  - (a) Feedback
  - (b) Boundary
  - (c) Interface
  - (d) Counter measure( )
5. In what manner, coding and testing are done?
  - (a) Top-down
  - (b) Bottom up
  - (c) Cross sectional
  - (d) Ad hoc( )
6. To run the old system and the new system at the same time for specified period, the system implementation approach used is:
  - (a) Phased
  - (b) Pilot
  - (c) Parallel
  - (d) Direct( )
7. The first step to the system study project is do:
  - (a) Define system performance criteria
  - (b) Describe information needs

- (c) Announce the study project  
(d) Staff for the study project ( )
8. A system's revision can be resulted because of:  
(a) Desire for more business (b) Changes in laws  
(c) A need for more time (d) All of the above ( )
9. A decision table:  
(a) Documents rules that select one or more actions based on one or more conditions from a set of possible conditions  
(b) Represents an information flow  
(c) Shows the decision paths  
(d) Gets an accurate picture of the system ( )
10. System prototyping helps the designer in:  
(a) Communicating to the user, quickly, how the system, when developed will look and get a feedback  
(b) Making the programmers understand how the system will work  
(c) Giving the demonstration of the software to the system manager  
(d) All of the above ( )
11. The MIS should developed by:  
(a) The manager  
(b) The information specialist  
(c) Both a and b  
(d) Neither a nor b ( )
12. A chart comprised of bars, each representing a period of time, is called a:  
(a) Cent chart (b) Gault chart  
(c) Both a and b (d) Grand chart ( )
13. During the MIS development process, progress reporting meetings are held:  
(a) Daily  
(b) Weekly  
(c) Monthly  
(d) Only on an 'as needed' basis ( )
14. Computer information systems are most successful in providing information for:  
(a) Control decisions (b) Planning decisions  
(c) Strategic decisions (d) None of the above ( )
15. Which of the following is considered to be an interface between functional applications and the database?  
(a) Management Information System  
(b) Database Management System



- (c) Data Processing System  
(d) None of the above ( )
16. Which of the following is generally true about management reports?  
(a) Low level managers need information in the form of detailed report  
(b) Reports can be issued on demand periodically, or on the occurrence of a specific event  
(c) Middle managers use exception reports  
(d) All of the above ( )
17. A greater proportion of time is spent in planning on the :  
(a) Top management (b) Middle management level  
(c) Lower management level (d) None of the above ( )
18. A central purpose of most decision support system is:  
(a) to build a model of the decision making problem  
(b) to design a database management system  
(c) to build an expert system  
(d) None of the above ( )
19. Which of the following is not a key component of the evaluation process in building a DSS?  
(a) Criteria for evaluation  
(b) Means of measuring system development time spent on the project  
(c) Means of monitoring the progress of the DSS  
(d) Formal review process ( )
20. Logical models form the basis for computing system that generate information useful in dealing with:  
(a) Uncertain situation  
(b) Complex situation  
(c) Dynamic situations  
(d) All of the above ( )
21. The selection of the solution technique to be implemented by a computing system should be made by:  
(a) System analysis  
(b) An operations research expert  
(c) A computer programmer  
(d) A computing system user ( )
22. MRP stands for:  
(a) Marketing research planning  
(b) Management resources planning  
(c) Manufacturing resources planning

- (d) Material requirement planning ( )
23. A periodic report can be used to:  
(a) Identify the problem  
(b) Identify solution  
(c) Evaluate solutions  
(d) Select solution ( )
24. An periodic report can be used to:  
(a) Aged account receivable report  
(b) Overtime earnings report  
(c) Both a and b  
(d) neither a and b ( )
25. An EQQ formula is an example of a(n):  
(a) Static model  
(b) Optimizing model  
(c) Deterministic model  
(d) All of the above ( )
26. Linear programming identifies:  
(a) The optimum identifies  
(b) The maximum profit of minimum cost that can be expected  
(c) both a and b  
(d) Neither a and b ( )
27. The two functional areas concerned with materials flow are:  
(a) Production and marketing  
(b) Manufacturing and purchasing  
(c) Marketing and finance  
(d) Manufacturing and finance ( )
28. Data collection terminals:  
(a) Record employee attendance  
(b) Track the flow of materials from one production area to another  
(c) Record start and stop of production steps  
(d) All of the above ( )
29. A system can be composed of more than one:  
(a) Subsystem (b) Element  
(c) Super system (d) None of the above ( )
30. The computer is a part of the firm's:  
(a) Physical system (b) Conceptual System  
(c) Locking (d) Neither a nor b ( )

31. Encryption is being used primarily with:  
(a) Transaction Entry (b) Computer Processing  
(c) File retention (d) Data communication ( )
32. PERT and CPM are:  
(a) Network techniques (b) Assignment technique  
(c) Project evaluation techniques (d) None of the above ( )
33. Zani's framework of effective MIS argues that MIS can only be designed in:  
(a) Top down techniques (b) Coordinate fashion  
(c) Bottoms up (d) By managerial participation ( )
34. A transportation problem in which the total supply available at the origins exactly satisfies the total demand required at the destinations is known as:  
(a) Degenerate solution  
(b) Balance transportation problem  
(c) Unbalance transportation problem  
(d) All of the above ( )
35. The funds management subsystems attempt to:  
(a) Increase cash input (b) Decrease cash input  
(c) Balance cash inflow with outflow (d) All of the above ( )
36. Management has become more complex because:  
(a) There is less time to react to competitive actions  
(b) The equipment used in many of the firm's activities has become more complex  
(c) Firms have become larger  
(d) All of the above ( )
37. Marketing planning is concerned with:  
(a) Planning the amount and placement of newspaper  
(b) Planning consignment sale contract to be offered  
(c) Planning sales force size and deployment  
(d) All of the above ( )
38. The marketing mix does not include:  
(a) Place (b) Product  
(c) Persuasion (d) Promotion ( )
39. A quotation system obtains potential delivery time data from the:  
(a) Production schedule file (b) Inventory  
(c) Product (d) All of the above ( )

40. One of the purchase order system's procedure sets is:  
(a) Automatic purchase order writing (b) Receiving  
(c) Account payable (d) None of the above ( )

**Answer Key**

1. (c)	2. (a)	3. (a)	4. (a)	5. (a)	6. (c)	7. (b)	8. (d)	9. (a)	10. (d)
11. (c)	12. (c)	13. (d)	14. (a)	15. (b)	16. (d)	17. (a)	18. (a)	19. (c)	20. (d)
21. (a)	22. (d)	23. (a)	24. (c)	25. (b)	26. (c)	27. (b)	28. (d)	29. (a)	30. (a)
31. (d)	32. (c)	33. (d)	34. (b)	35. (c)	36. (d)	37. (d)	38. (a)	39. (b)	40. (c)

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**DESCRIPTIVE PART - II**

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**Year 2006*****Time allowed : 2 Hours******Maximum Marks : 30*****Attempt any four questions out of the six. All questions carry 7½ marks each.**

- Q.1 (a) Define system and explain the various types of systems.  
(b) What do you mean by information? Explain its characteristics.
- Q.2 (a) Define MIS and discuss the significance of MIS in an organization  
(b) Explain various components of MIS.
- Q.3 (a) What do you mean by information requirement? Explain various types of information requirement at different levels of management.
- Q.4 (a) Explain simon's model of decision making in MIS.  
(b) Describe various steps of implementing an information system.
- Q.5 (a) Write an essay on pitfalls in MIS development.  
(b) Explain various steps used in evaluation personnel MIS.
- Q.6 Write short notes on the following:
- (a) Objectives of MIS
  - (b) System Design
  - (c) Use of MIS in Finance.

## GLOSSARY

10Base-T	A system of connecting computers on a LAN using twisted-pair cable. The method relies on compression to increase raw transfer rates to 10 megabits per second.
24 -7	Operation of an application or database 24 hours a day, 7 days a week. Because the database can never be shut down, performing maintenance is a challenge.
Access speed	A measure of disk drive speed. Loosely, the time it takes a disk drive to move to a particular piece of data.
Advanced encryption standard (AES)	A new U.S. standard for single-key encryption. Approved in 2001 by the government to replace DES and triple DES. With 128 bit keys, it is substantially more difficult to break; but still very fast to encrypt and decrypt.
Advocacy role	Someone in MIS, usually the chief information officer, who bears responsibility for exploring and presenting new applications and uses of MIS within the company.
Agent	An object-oriented program designed for networks that is written to perform specific tasks in response to user requests. Agents are designed to automatically communicate with other agents to search for data and make decisions.
American National Standards Institute (ANSI)	An organization responsible for defining many standards, including several useful information technology standards.
American Standard Code for Information Interchange (ASCII)	American standard code for information interchange. A common method of numbering characters so that they can be processed. For instance, the letter A is number 65. It is slowly being replaced by the ANSI character set table and the use of international code pages that can display foreign characters.
Antitrust laws	A variety of laws that make it illegal to use monopoly power. Some basic (economic) actions to achieve a competitive advantage are illegal. Strategic plans must be evaluated carefully to avoid violating these laws.
Application service provider (ASP)	A specialized Internet firm that provides an individual application to other businesses. For example, a reservation system can be run by an ASP to provide services to other companies.
Artificial intelligence (AI)	An attempt to build machines that can think like humans. Techniques evolved from this research help solve more complex problems. Useful techniques include expert systems, neural networks, massively parallel computers, and robotics.



Aspect ratio	Used to define the ratio of width to height in display screens. Standard definition TV was typically 6:4 (such as 640 x 480). HDTV is generally 16:9 (such as 1920 x 1080). Movies sometimes use a 1.85:1 ratio which is slightly wider than the HDTV 1.77:1.
Assumptions	Models are simplifications of real life, so they require assumptions about various events or conditions.
Asynchronous Transfer Mode (ATM)	A packet-based network system that uses high-speed transmission lines (150 megabits and over) and routers to maximize network efficiency and throughput.
Attributes	Descriptions of an object or entity. For example, a customer object would at least have attributes for name, phone number, and address.
Auction	In an e-commerce context, a Web-based system where individuals bid for items. Useful when you do not know the exact value of an item or have only a few items to sell. The auction site helps handle payments but charges a percentage fee.
Audit trail	The ability to trace any transaction back to its source. In accounting, transaction values are accumulated on the general ledger and used to create reports. An audit trail is a set of marks or records to point back to the original transaction.
Augmented reality	A display of a real-world scene with computer-generated data added to it. The computer data often adds names, descriptions, or drawings. For instance, a phone camera might be used to display a scene and tags are added to identify points of interest.
Authentication	The ability to verify the source of a message. Dual-key systems are a useful technique. The sender uses a private key to encrypt the message. The recipient applies the sender's public key. If the decrypted message is readable, it had to have come from the alleged sender, because the keys always work in pairs.
Backbone	A high-speed communication line that links multiple sub networks. It is usually a fiber-optic line.
Backward chaining	In an expert system, the user enters a "conclusion" and asks to see whether the rules support that conclusion.
Bandwidth	Traditionally, the amount of frequency allocated to a communication channel, such as the portion of the spectrum allocated to a single radio or television station. But, the term is commonly used to indicate the basic capacity or transmission speed of a communication channel. For example, 20 megabits per second instead of 5 megahertz.
Bandwidth hogs	On a shared network, a small percentage of users will transmit vastly more data than the average user. ISPs often define pricing methods to penalize heavy users to ensure that more bandwidth or capacity is available for all users.
Barriers to entry	Anything that makes it more difficult for new firms to enter an industry.

Several possibilities would violate antitrust laws. An acceptable barrier is the increased use of information systems, which raises the cost of entering an industry because a rival would have to spend additional money on information technology.

Beginners All-  
purpose  
Symbolic  
Instruction Code  
(Basic)

An early computer programming language designed to be easy to program and to teach. Visual Basic is a current version for Windows programming.

Benchmark

A set of routines or actions used to evaluate computer performance. By performing the same basic tasks on several machines, you can compare their relative speeds. Benchmarks are especially useful when the machines use different processors and different input and output devices.

Best practices

Methods that are known to work for solving specific problems. Most problems, including those in software development, have multiple solutions. Best practices are a collection of techniques for solving problems that have been tested and avoid common mistakes and problems.

BETWEEN

A portion of a SQL statement used to specify a lower and upper bound in a WHERE clause. Commonly used for dates, such as OrderDate BETWEEN 01-Jan-2008 AND 31-Dec-2008.

Bill of materials

Used in manufacturing, it is a list of components used to manufacture a finished product. In an ERP system, data from it is often used to trigger inventory deductions and to add the finished product to inventory.

Bill presentation  
and payment

Web-based software that automatically displays bills and invoices for customers. The payment side accepts various forms of payment including credit cards and electronic checks. Generally run as a Web service.

Binary data

A collection of ones and zeros called bits. Computer processors operate only on binary data. All data forms are first converted to binary.

Biometrics

A field of study that is trying to determine how to identify people based on biological characteristics. The most common devices are fingerprint and handprint readers.

Bit

The smallest unit of data in a computer. All data is converted to bits or binary data. Each bit can be in one of two states: on or off. Bits are generally aggregated into collections called a byte.

Bitmap image

A method of storing images. The picture is converted to individual dots that are stored as bits. Once a picture is stored in bitmap form, it is difficult to resize. However, bitmaps are good for displaying photographic images with subtle color shading.

Blog

Web log. Say it fast and you can hear the abbreviation. A special type of Web site with software that makes it easy for a user to enter comments. Typically used as a daily journal.

Bluetooth	<p>A short-range wireless network technology invented by IBM. It is most commonly used for cell-phone devices such as headsets. The data transmits a 1 mbps up to 32 feet. It is one of the few network protocols to automatically encrypt the data. Newer versions offer higher data rates.</p>
Board of directors	<p>A group of people paid to oversee and evaluate the decisions of the company. Technically the CEO reports to the board of directors, but they are charged more with reviewing the CEO's decisions. Most boards have the authority to remove a CEO, but many board members are selected by the CEO.</p>
Boolean search	<p>Searching for data by using the logic operators AND, OR, and NOT conditions in a WHERE statement; for example, find a list of customers where city = "Detroit" and age &gt; 50 and do not own a car.</p>
Bottom-up development	<p>An approach to designing and building systems in which workers build system components to solve each problem as it arises. Eventually the pieces are combined to create an integrated system. The method relies on standards and controls to facilitate cooperation and integration. See also top-down development.</p>
Brainstorming	<p>A group technique in which each individual is asked to come up with possible suggestions to a problem. Any ideas are useful, regardless of how wild they are. Even fanciful ideas could stimulate someone else to improve it or to explore a related area.</p>
Break (report)	<p>A report that organizes output by sections that are based on the data values. Common business examples include reports by customer or employee, where data for each person is displayed in a group.</p>
Break footer	<p>The section of a break or group report that displays subtotals for the data within the group. See also break.</p>
Break header	<p>The section of a break or group report that displays the column headings for the data within the group. See also break.</p>
Broadcasts	<p>A technique of transmitting messages using radio, micro, or infrared waves. Broadcast messages are sent to all devices in a certain area. Others in the vicinity can also receive the messages.</p>
Browser	<p>A software tool that converts World Wide Web data into a graphical page with hypertext links. Using standard (HTML) commands, companies can offer data and additional links to users. Users simply click on individual words and pictures to retrieve additional data and move to other network sites.</p>
Brute force	<p>An attack on encrypted data that attempts to use every possible key. Can be stopped by using very long keys. For example, using a key or password of only three letters means there are only <math>26*26*26=17,576</math> possible values. Even a slow computer can test all combinations in a few seconds.</p>
Bulletin board system (BBS)	<p>Similar to a typical bulletin board, except that people access it from computers. The BBS enables users to store comments, pictures, and files for other people to retrieve. Bulletin boards are usually organized by</p>

	<p>topics and can be searched for specific phrases or comments. They are a useful way to disseminate information that is of interest to many different people.</p>
Bus	<p>Most computers have special slots called a bus to provide high-speed connections to other devices. Various manufacturers make boards that fit into these slots. The processor can exchange data with these other devices, but performance is sometimes constrained by the design of the bus.</p>
Bus network	<p>A network organizing scheme in which each computer is attached to a common transmission medium. Protocols are needed to determine when a machine can transmit and to recover from collisions.</p>
Business process management (BPM)	<p>Also see workflow software. The concept that business actions have to be performed in a specific sequence. Managing the process entails finding efficiencies through automating or reordering. For example, purchasing expensive items requires discussions and approvals by a variety of managers.</p>
Business to business (B2B)	<p>Business-to-business electronic commerce; sales by suppliers to other businesses over the Internet; often long-term relationships. See B2C and EDI.</p>
Business to consumer (B2C)	<p>Business-to-consumer electronic commerce; purchases by individual consumers similar to traditional mail-order systems, but conducted on secure Web sites over the Internet.</p>
Byte	<p>A collection of bits. Traditionally, 8 bits make up one byte. From binary arithmetic, an 8-bit byte can hold 2 to the 8th power, or 256, possible numbers. In many systems a byte is used to hold one character.</p>
C	<p>A powerful programming language that is flexible and creates efficient code. A language commonly used to build complex applications and to create commercial software products.</p>
C++	<p>An object-oriented extension of the C programming language. It is commonly used to build commercial software. It produces efficient code and supports the development of reusable objects.</p>
Cable modem	<p>An Internet connection device that translates local area network protocols to run over a television cable line. It can provide transmission speeds around 1.5 Mbps. But the communication line is shared with other users.</p>
Cache	<p>A buffer between the processor and a slower device such as a printer, disk drive, or memory chips. The cache generally consists of high-speed memory. Data is transferred in bulk to the cache. It is then pulled out as it is needed, freeing up the processor to work on other jobs instead of waiting for the slower device to finish.</p>
CAN-SPAM Act	<p>The U.S. Act that makes it illegal to send commercial e-mail messages to people who do not want to receive them. For business, the key is that it makes e-mail messages legal, as long as all of the rules are followed.</p>
Capability	<p>A system designed at the Carnegie Mellon Software Engineering Institute</p>



maturity model integration (CMMI)	to help organizations improve their software development processes. A key element is to work toward a formal development model that is measurable and is continually upgraded. The CMMI system is an upgrade of the older CMM process.
Carrier-Sense, Multiple-Access/ Collision Detection (CSMA/CD)	A communications protocol that determines how computers will behave on a shared-medium network. Ethernet protocols rely on CSMA/CD. Other alternatives are Token Ring and packet switching.
Case-based reasoning	An expert system approach that records information in the form of situations and cases. Users search for cases similar to their current problem and adapt the original solution.
Catalog management system	A software tool that holds product descriptions, images, and prices to simplify changing and uploading data to a Web site. It makes it easier to track thousands of products to ensure the Web site data is correct.
CD-ROM	Compact disk-read only memory. Data is stored and retrieved with a laser. A special machine is required to create data on a CD-ROM. Used to hold data that does not change very often. Useful for multimedia applications because a disk can hold about 650 megabytes of data. The format used to store music CDs.
Centralization	A business scheme for performing most operations and making management decisions from one location in an organization. MIS organization can be examined in four areas: hardware, software, data, and personnel. See also decentralization.
Certificate authority (CA)	Dual-key encryption and authentication require that the public key be published and available to others. A certificate authority is an organization that validates the owner's identity, issues the keys, and runs the public directory. Almost anyone can run the software to be a CA, but others must trust that host.
Certifications	Vendors provide exams to test workers in their specific technologies and offer a certificate so that potential employers can be sure that job applicants possess a defined level of knowledge. Common certifications include Cisco (networks) and Microsoft (server administration and development). The industry constantly argues over whether certifications have value.
Change agents	Objects or people who cause or facilitate changes. Sometimes the change agent might be a new employee who brings fresh ideas; other times change can be mandated by top-level management. Sometimes an outside event such as a competitor or a hurricane forces an organization to change.
Change drivers	Concepts or products that have altered the way businesses operate. Classic examples include bar code scanners in retail stores, handheld miniterminals or notebooks by delivery firms and salespeople, and

	reservation systems by travel and entertainment industries.
Charge-back system	A scheme for charging other internal departments for services. For example, some firms charge departments a fee based on how often they use the central computer. The goal is to ration a limited resource by avoiding free use and to provide a lever for user departments to hold MIS accountable.
Chart of accounts	A listing of all the accounts and subaccounts in the general ledger. It must be defined ahead of time for each business.
Check in	A step in version control systems. When a user is finished making changes to a file, the user checks in the file to the repository to make it fully available to other users. The user must first check out the file.
Check out	A step in version control systems. A user checks out a file or document to indicate that changes will be made. To prevent concurrency problems, the document is usually locked so that others cannot make changes at the same time. When finished, the user checks in the file.
Chief executive officer (CEO)	The head of a company. The person ultimately responsible for setting the direction and policies of the firm. Usually the CEO is also the chairperson of the board of directors.
Chief information officer (CIO)	The person who is in charge of the MIS organization within a firm, charged with overseeing operations, setting MIS priorities, and being a top-level advocate for MIS. Also develops and supports strategy for the firm.
Circular reference	In a spreadsheet, a set of cells that eventually refer to each other. In the simplest example, cell A1 would use values stored in cell A2, but cell A2 uses the value stored in A1. This technique is sometimes used to create an iterative solution to a model.
Classes	Base descriptions of objects. Technically, classes describe generic attributes and methods. Objects are a specific instance of a class.
Click-through rate	Used in Web advertising, the percentage of people viewing an online ad who actually click it to see the details on the advertised product or service. By 2000, the average click-through rates had declined to less than 1 percent. But it is not necessarily a good measure of advertising effectiveness.
Client-server network	A network configuration in which a few machines are used as file servers and the others (clients) are independent workstations. Shared data is first sent to a file server where it can be examined or transferred by another client.
Client-server organization	A method of organizing the MIS function so that some operations are centralized while others are decentralized. The client-server model separates all of the components into two categories: servers or clients. The functions associated with the server tend to be centralized, whereas the client components and tasks are dispersed among the users.



Clip art	Artwork created and sold to be used by nonartists. Hundreds of collections are available of people, places, buildings, and other objects. Clip art images are often used to create presentations and illustrate reports.
Clipboard	The method used to transfer data between software packages in windows-oriented operating environments. All objects that are cut or copied are placed onto the clipboard, ready to be pasted to another location or another package. Clipboard viewers exist to show the current contents of the clipboard. Some software systems allow a clipboard to hold several cuttings. Many automatically delete the older cuts—keeping only the most recent.
Clipper chip	An encryption method created by the U.S. top-secret National Security Agency (NSA). It uses a secret algorithm to encrypt and decrypt digital messages. It was particularly designed for digital voice communication. Its key feature is the use of two escrow keys assigned to each chip. If the police decide they want to listen to a conversation between two suspects, they can get a court order, collect the escrow keys, and instantly decrypt the call.
Closed loop	A system or piece of computer code in which every step in a control mechanism is contained inside the system and does not utilize external input. See also feedback.
Closed system	A system that is entirely self-contained and does not respond to changes in the environment. Most closed systems eventually fail due to entropy.
Cloud computing	The process of running the main part of an application on servers on the Internet. The servers are generally scalable and provide redundancy. Cloud services available to the public are usually charged on some type of per-use fee basis so firms can buy the level of computing.
Coaxial cable	A cable used to transmit data. Cable television is a widespread application. The inner cable is surrounded by a plastic insulator, which is surrounded by a wire mesh conductor and an outer casing. The wire mesh insulates the internal signal wire from external interference.
Cold site	A facility that can be leased from a disaster backup specialist. A cold site contains power and telecommunication lines but no computer. In the event of a disaster, a company calls the computer vendor and begs for the first available machine to be sent to the cold site.
Collision	In networks, a collision arises when two computers attempt to broadcast messages at the same time. The network protocols need to identify the situation and determine which machine will go first.
Co-location	Installing your computer or network equipment in another's facilities to obtain access to high-speed data communication lines. You pay a fee for use of the facilities, power, cooling, and network usage.
Column	A vertical part of a table that holds data for one attribute of an entity in a database or spreadsheet. For example, a table to describe automobiles will

	have columns for make, model, and color.
Command-line interface	A method of controlling the computer by typing commands. The user must generally memorize specific commands. Older machines still use them because GUI systems require too much overhead. Some people prefer command lines, because it is faster to type one or two commands than to manipulate an image on the screen.
Commerce server	A software system that runs an e-commerce Web server. It handles the product catalog, searching, a shopping cart, and the payment mechanism. Several vendors sell versions to be run on your own server, or you can lease space on a hosting company.
Common Business-Oriented Language (COBOL)	An early programming language designed to handle typical transaction-processing tasks. Its death has been predicted for years, but it is hard to throw away billions of lines of code.
Competitive advantage	Something that makes your company better or stronger than your rivals. Examples include lower costs, higher quality, strong ties to loyal customers, and control over distribution channels.
Composite key	In defining a database table, each table must have a primary key. When the primary key consists of more than one column, it is referred to as a composite key. The business relationship between the multiple columns are many-to-many.
Compound document	A document that incorporates different types of data: text, graphics, sound, and video. The different objects might be transmitted across a network to be included in a final document.
Computer-aided design (CAD)	Programs that are used to create engineering drawings. CAD programs make it easy to modify drawings. They also make it easier to keep track of material specifications. They can perform spatial and engineering estimates on the designs, such as surface or volume calculations.
Computer-aided software engineering (CASE )	Computer programs that are designed to support the analysis and development of computer systems. They make it easier to create, store, and share diagrams and data definitions. Some versions even generate code. There are two categories of CASE tools: software development and maintenance of existing systems.
Computer-integrated manufacturing (CIM)	Using a computer to control most of the production equipment in a manufacturing environment. The computer can monitor the production statistics. It is also used to set individual machine controls.
Computer ethics	The concept that all of us have an obligation with respect to data. For example, managers have a responsibility to customers to protect personal data, to collect only data that is truly needed, and to give customers the ability to correct errors in personal data.

Computer information system (CIS)	See management information system (MIS).
Composite key	In relational databases, a key that consists of more than one column. The columns are combined to yield a unique primary key.
Concurrency	A situation that arises when applications attempt to modify the same piece of data at the same time. If two people are allowed to make changes to the same piece of data, the computer system must control the order in which it processes the two requests. Mixing the two tasks will result in the wrong data being stored in the computer.
Content management system	Changing text and images on a Web site can be challenging, particularly with thousands of pages and hundreds of contributors. Contributors can write changes in simple text format to a content management system which then formats and uploads the data to the Web site automatically.
Context diagram	The top level of a data flow diagram that acts as a title page and displays the boundaries of the system and displays the external entities that interact with the system.
Continuous quality improvement	The concept that any process can be improved by continually evaluating the system and making adjustments and refinements. The concept is also applied to service processes, but relies on a measurable performance objective.
Converge	The ability of an iterative model to stabilize on a fixed solution. The alternative is that values continually increase and never reach a solution.
Cookies	Small text files that a Web server sends to client computers. When the user returns to a site, the browser automatically returns the cookie file. Servers use them to keep track of transactions—so they know when the same user has returned. Marketers have used them to track individual users on the Web.
Copyright	A legal ownership right granted to the creators of intellectual property. All works are automatically copyrighted. Registering with the copyright office is not required but grants additional protection to the owner.
Critical success factors	A limited number of concrete goals that must be met for the organization to be successful. Identifying these key factors helps determine the strategic directions and highlights the areas that can benefit from improved information systems.
Customer relationship management (CRM)	A system for tracking and integrating all customer data. Salespeople, managers, and clerks all have access to the same data, so everyone has the same consolidated view of all customer interactions.
Data	Consists of factual elements (or opinions or comments) that describe some object or event. Data can be thought of as raw numbers or text.
Data	MIS manager who is charged with overseeing all of the data definitions

administrator	and data standards for the company to ensure that applications can share data throughout the company.
Data dictionary	Contains all of the information to explain the terms used to define a system. Often includes report descriptions, business rules, and security considerations.
Data encryption standard (DES)	An older method of encrypting data that was commonly used by financial institutions. With current computer capabilities that can break a DES-encrypted message, DES is no longer considered a secure encryption system.
Data flow diagram (DFD)	A diagramming technique used to analyze and design systems. It shows how a system is divided into subsystems and highlights the flow of data between the processes and subsystems. It displays processes, external entities, files, data flows, and control flows.
Data independence	Separating programs from their data definition and storage. The main advantage is that it is possible to change the data without having to change the programs.
Data integrity	(1) A concept that implies data is as accurate as possible. It means the database contains few errors. (2) Keeping data accurate and correct as it is gathered and stored in the computer system.
Data mart	A small version of a data warehouse. A database designed to hold concise collections of data for retrieval and analysis by managers.
Data mining	An automated system that examines data for patterns and relationships. It is partly based on statistics, but also searches for more specific associations. The results are not always applicable to other situations.
Data mirroring	The ultimate backup technique where all data that is stored on one machine is automatically transferred and stored on a second computer. Useful to prevent loss of data and recover from disasters—particularly when the second computer is located many miles away.
Data store	A file or place where data is stored. In a realistic setting, a data store could be a computer file, a file cabinet, or even a reference book.
Data types	To humans, there are four basic types of data: text and numbers, images, sound, and video. Each data type must be converted to binary form for computer processing.
Data warehouse	A single consolidation point for enterprise data from diverse production systems. The data is typically stored in one large file server or a central computer. Because legacy systems are difficult to replace, some data is copied into a data warehouse, where it is available for management queries and analysis.
Database	A collection of related data that can be retrieved easily and processed by computers; a collection of data tables.
Database administrator	(1) A person appointed to manage the databases for the firm. The DBA needs to know the technical details of the DBMS and the computer



(DBA)	system. The DBA also needs to understand the business operations of the firm. (2) A management person in the MIS department charged with defining and maintaining the corporate databases. Maintaining data integrity is a key component of the job.
Database management system (DBMS)	Software that defines a database, stores the data, supports a query language, produces reports, and creates data-entry screens.
Decentralization	Moving the major operations and decisions out to lower levels within the firm. In MIS, decentralization has largely been led by the declining cost and improved capabilities of personal computers. See also centralization.
Decision biases	Without models and careful analysis, decisions made by people tend to be biased. There are several biases in each of the four systems categories: data acquisition, processing, output, and feedback.
Decision process	The steps required to make a decision. It includes problem identification, research, specification of choices, and the final selection. Midlevel managers are often involved in the initial stages and affect the outcome, even though they may not make the final decision.
Decision support system (DSS)	System to use data collected by transaction-processing systems to evaluate business models and assist managers in making tactical decisions. There are three major components: data collection, analysis of models, and presentation.
Decision tree	A graphical representation of logic rules. Each possible answer to a question or situation leads to a new branch of the tree.
Default value	A value that is automatically displayed by the computer. Users can often override the default by deleting the old value and entering a new one. The goal is to choose a value that will almost always be entered, so the user can skip that item.
Descriptive model	A model that is defined in words and perhaps pictures. Relationships between objects and variables tend to be subjective. Useful for an initial understanding of a system but difficult to evaluate by computer.
Desktop publishing (DTP)	The art of creating professional documents with personal computers and small laser printers. Beyond basic word processing, DTP software provides controls to standardize pages, improve the page layout, and establish styles.
Detail section	The section in a report that is repeated for every row in the associated tables. It is often used for itemized values, whereas group and page footers are used for subtotals.
Device drivers	Small software modules that provide the interface from an operating system to a hardware device. Manufacturers improve and rewrite their device drives, so you should periodically update your system to obtain the newer drivers.
Diagnostic	Spotting problems, searching for the cause, and implementing corrections.

situations	<p>Examples include responding to exception reports to identify problems and potential solutions, and determining why the latest marketing approach did not perform as well as expected.</p>
Dial-back modem	<p>A special modem placed on a central computer. When a user attempts to log in, the dial-back modem breaks the connection and calls back a predefined phone number. Its use minimizes the threat of outsiders gaining access to the central computer.</p>
Digital cash	<p>An electronic version of money that is provided and verified by a trusted third party. It consists of an encrypted number for a specified value that can only be used one time. It provides for verifiable and anonymous purchases using networks.</p>
Digital certificate	<p>Part of an authentication mechanism used with dual-key encryption. Companies that host servers need to encrypt transactions over the Internet. They purchase a digital certificate from a certificate authority and install it on the Web server. The client browser recognizes the certificate key and encrypts the data.</p>
Digital dashboard	<p>A visual presentation of broad measures of current activity in an organization. The data is generally displayed as gauges, and the system must be customized for each organization. As part of an executive information system, managers can drill down to get more data.</p>
Digital divide	<p>The distance between those individuals or nations who have network capabilities and those who do not. Despite declining costs, many people and many nations cannot afford the hardware and software. If a large portion of the economy moves online, it could alienate those who cannot afford the network connection.</p>
Digital rights management (DRM)	<p>A combination of encryption and Internet validation for protecting vendor copyrights to prevent unauthorized copying of digital content (software, music, books, movies, and so on).</p>
Digital signature	<p>Any electronic signature technology that verifies the user. U.S. law now recognizes digital signatures as equivalent to handwritten ones. The most secure system is to obtain a digital certificate from a public company that verifies each person's identity. But the IRS accepts a simple PIN issued by the agency as a digital signature.</p>
Digital subscriber line (DSL)	<p>A special phone service connection available to customers within 3 miles of the phone company's switch. It provides about 1 Mbps transmission speed for Internet connections.</p>
Digital video/versatile disk (DVD)	<p>A digital format primarily used for storing video and movies. However, it can also hold audio and traditional computer data. One side of the disk can hold over 3 gigabytes of data.</p>
Direct sequence spread spectrum (DSSS)	<p>A network transmission protocol commonly used for wireless connections. It subdivides the allocated frequency to send multiple packets at the same time. Communication packets can shift frequencies at each time slot. By making more efficient use of the spectrum, more data</p>



	can be transmitted.
Disintermediation	In an e-commerce context, using a Web-based system to skip over sections of the production chain, such as manufacturers selling directly to consumers. The approach can give the manufacturer a higher percentage of the sale price, but risks alienating retailers, resulting in lost sales.
Distribution center (DC)	A central point in a supply chain where incoming bulk goods are split and merged into multiple shipments to the final destination. For example, a truckload of bread would be unloaded and individual boxes placed on other trucks, along with other food items for distribution to a grocery store.
Distribution channel	The layers of distributors in between the manufacturer and the final customer. If a producer can gain control over this means of getting the product to the consumers, the producer can prevent new rivals from entering the industry. Improved communication systems offer the possibility of eroding control over some distribution channels.
Diverge	The property of an iterative model where successive computations keep leading to larger values (in magnitude). The model never reaches a stable solution. Generally due to insufficient or incorrect feedback mechanisms.
Documentation	Descriptions of a system, its components, the data, and records of changes made to the system.
Domain name system (DNS)	A set of computers on the Internet that converts mnemonic names into numeric Internet addresses. The names are easier for humans to remember, but the computers rely on the numeric addresses.
Download	To transfer files from a remote computer to a local computer (usually a personal computer). See also upload.
Drill down	To use an information system to get increasingly detailed data about a company. In an enterprise information system, the ability to look at overall company data, and then select breakdowns by regions, departments, or smaller levels.
Dot-com	Abbreviation given to the many Internet firms formed in the late 1990s because their Internet names ended with the .com suffix. For a couple of years, having a dot-com name was prestigious and attracted funding. When hundreds of these firms failed in 2000 and 2001, they became known as dot-bombs.
Dots per inch (dpi)	A measure of the resolution of devices including printers and displays. Higher values representing more dots per inch provide more detailed images and text. Some people use the term pixels (ppi) instead of dots.
Drill down	The action in a data analysis package or executive information system where the user clicks a link to obtain more detail about a specific situation. See also roll up.
Dual-key encryption	A method of encrypting a message that requires two keys: one to encrypt and one to decrypt. One of the keys is a public key that is available to

	<p>anyone. The other key is private and must never be revealed to other people. RSA is a popular dual-key encryption system. Dual-key systems can also be used to authenticate the users.</p>
Dynamic data exchange	<p>An early method of linking data from multiple sources with the Windows operating system. The software packages literally send messages to other software packages, which enables them to combine and update data. See also dynamic integration as well as Object Linking and Embedding (OLE).</p>
Dynamic host control protocol (DHCP)	<p>The standard Internet method for assigning Internet addresses to a computer. A DHCP server is given a database with a range of IP addresses and it assigns an unused number to a computer when it requests one on startup. The process means that IP addresses on specific computers can change over time unless the computer is allocated a static address in the database.</p>
Dynamic integration	<p>A means of linking data from multiple documents. One compound document (or container) can hold data objects created by other software. As the original data is changed, it is automatically updated in the container document. See also static integration.</p>
e-Business	<p>Electronic business. The process of conducting any type of business over the Internet. It includes all forms of e-commerce and m-commerce, as well as internal processes and Web services.</p>
e-Commerce (EC)	<p>Electronic commerce. The process of selling items over the Internet. The most familiar form is business-to-consumer, but it includes business-to-business and auction sites like eBay.</p>
e-Discovery	<p>Electronic discovery. In legal cases, a request for all electronic data—particularly e-mail communications, but might also include accounting or other data from any computer system. Companies establish policies to define storage life and destruction policies to ensure old data is deleted automatically from systems.</p>
E-mail	<p>Electronic mail, or messages that are transmitted from one computer user to another. Networks transfer messages between the computers. Users can send or retrieve messages at any time. The computer holds the message until the recipient checks in.</p>
Electronic data interchange (EDI)	<p>Exchanging transaction data with entities outside the control of your firm. Private connections can be established directly between two firms. Public networks are also being formed where one provider collects data and routes it to the appropriate client.</p>
Encryption	<p>A method of modifying the original information according to some code, so that it can be read only if the user knows the decryption key. It is used to safely transmit data between computers.</p>
End-user development	<p>Managers and workers are to develop their own small systems using database management systems, spreadsheets, and other high-level tools.</p>

Enterprise network	A network that connects multiple sub networks across an entire firm. Often, the networks use different protocols and different computer types, which complicates transmitting messages.
Enterprise resource planning (ERP)	An integrated computer system running on top of a DBMS. It is designed to collect and organize data from all operations in an organization. Existing systems are strong in accounting, purchasing, and HRM.
Entrepreneurship	The act of creating and organizing a business. Generally, an entrepreneur takes the risks to create a new business in search of a profit.
Ergonomics	The study of how machines can be made to fit humans better. One of the main conclusions of this research in the computer area is that individuals need to be able to adjust input (and output) devices to their own preferences.
Escrow key	In an encryption system, it is a special key that can be used by government officials to decrypt a secret conversation. The Clipper chip uses escrow keys.
Ethernet	A network communications protocol that specifies how machines will exchange data. It uses a broadcast system in which one machine transmits its message on the communication medium. The other machines listen for messages directed to them.
Ethics	The concept that various elements of society have obligations to the others. In IT, it focuses on the roles of users, developers, and vendors.
Event-driven approach	A user-interface approach where the user controls the sequence or operations and the software responds to these events. Events can range from a simple key-press to a voice command. Modern, window-based software does not follow a sequential process. Instead, actions by users generate events. The programs
Exception report	Report that is triggered by some event to signify a condition that is unusual and needs to be handled immediately.
Executive information system (EIS)	A type of decision support system that collects, analyzes, and presents data in a format that is easy to use by top executives. To achieve this objective, the EIS is based on a model of the entire company. In most cases the model is presented graphically and the executives retrieve information by pointing to objects on the screen.
Exhaustive testing	Testing every possible combination of inputs to search for errors. Generally not a feasible option, so most computer systems will always contain errors.
Expert system (ES)	System with the goal of helping a novice achieves the same results as an expert. They can handle ill-structured and missing data. Current expert systems can be applied only to narrowly defined problems. Diagnostic problems are common applications for expert systems.
Expert system	A program that provides a way to collect data, enter rules, talk to users,

shell	present results, and evaluate the rules for an expert system.
Export	An older method of exchanging data among various software packages. One package exports the data by storing it in a format that can be read by other software. Object Linking and Embedding is a more powerful way to exchange data.
Extensible business reporting language (XBRL)	A specific XML style for reporting financial data in a standard way. Predefined tags are used to mark the financial data to make it easier for computers to extract and compare data from diverse companies.
External agents	Entities that are outside the direct control of your company. Typical external agents are customers, suppliers, rivals, and governments. Competitive advantages can be found by producing better-quality items or services at a lower cost than your rivals. Also, many firms have strengthened their positions by building closer ties with their suppliers and customers.
External entity	Objects outside the boundary of a system that communicate with the system. Common business examples include suppliers, customers, government agencies, and management.
Extraction, transformation, and loading (ETL)	The process in data warehouses that involves taking data from existing systems, cleaning it up, and moving it into the data warehouse.
Extranet	A network configured to give certain outsiders, usually customers and suppliers, limited access to data using Web-based systems.
Extreme programming (XP)	A new version of development loosely based on prototyping. Pairs of developers rapidly build and simultaneously test applications. The goal is to build releases and then modify them to meet the changing needs of the users.
Facsimile (Fax)	A combination scanner, transmitter, and receiver that digitizes an image, compresses it, and transmits it over phone lines to another facsimile machine.
Fault tolerance	The ability of a computer or a system to continue functioning properly even if some of the components fail. Fault-tolerant machines rely on duplication of subsystems with continuous monitoring and automatic maintenance calls.
Feasibility study	A quick examination of the problems, goals, and expected costs of a proposed system. The objective is to determine whether the problem can reasonably be solved with a computer system.
Feedback	Well-designed systems have controls that monitor how well they meet their goals. The information measuring the goals and providing control to the system is known as feedback.
Fiber optic cable	A thin glass or plastic cable that is internally reflective. It carries a light



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	wave for extended distances and around corners.
File server	Computer on a network that is used to hold data and program files for users to share. To be effective, it should use a multitasking operating system.
File transfer protocol (FTP)	A standard method of transferring files on the Internet. If you control a computer, you can give other users access to specific files on your computer without having to provide an account and password for every possible user.
Firewall	A small, fast network computer device that examines every packet entering a company. Rules or filters can be created that will reject certain packets that are known to be dangerous to the network.
First mover	In a model of rivalry, the firm that takes the initial action. Sometimes the first mover gets a benefit by setting the strategy and the market. But the costs are often higher because the technology is newer. Games such as chess recognize that the first mover has a slight benefit.
Five Forces model	Michael Porter's model used to search for competitive advantage. The Five Forces are: rivals, customers, suppliers, potential competitors, and substitute products.
Floating point operations per second (FLOPS)	The number of mathematical calculations a processor can perform in one second. Typically measured in millions (mega-FLOPS) or billions (giga-FLOPS). Bigger numbers represent faster processors.
Flow chart	An old pictorial method for describing the logic of a computer program. It has largely been replaced by pseudo code.
Font size	An important characteristic of text is its size. Size of type is typically measured in points. For reference, a capital letter in a 72-point font will be approximately 1 inch high.
Forward chaining	In an expert system, the ES traces your rules from the data entry to a recommendation. Forward chaining is used to display questions, perform calculations, and apply rules.
Frame	A related set of information that humans group together. Sometimes groupings can be arbitrary. A concept used in discussing AI applications and human cognition.
Frame relay	A network communication system that uses variable-length packets. It is useful for high-speed, large bursts of data. It is being used for long-distance network communications.
Franchise	A means of organizing companies. Independent operators pay a franchise fee to use the company name. They receive training and benefit from the name and advertising of the parent company. They purchase supplies from the parent company and follow the franchise rules.
Frequency division multiplexing	Supporting multiple communications at the same time by assigning a specific frequency range to each participant. For example, television and radio stations are assigned specific frequency ranges to avoid collisions.



(FDM)	
Front-end processor	A simple communications device for large central computers that accepted all of the terminal wires and then assigned each user to an open communications port on the computer. This device decreased the number of physical access ports required on the computer.
Full duplex	A method of transferring data, usually over phone lines, so that data is transmitted in both directions simultaneously. In terms of speaker phones, it means that people on both ends of a call can talk at the same time. With half duplex, the initial speaker blocks others from talking.
Functions	See methods.
Fuzzy logic	A way of presenting and analyzing logic problems that is designed to handle subjective descriptions (e.g., hot and cold).
General ledger	A collection of accounts that break financial data into specific categories. Common categories include accounts receivable, accounts payable, inventory, and cash.
Geographic information system (GIS)	Designed to identify and display relationships among business data and locations. Used to display geographical relationships. Also used to plot delivery routes and create maps.
Gibibyte	The IEC definition for billion in binary base 2 (2 <sup>30</sup> ). It replaces the term gigabyte which now is to be used for decimal billion.
Gigabyte	Approximately 1 billion bytes of data. Technically, 2 raised to the 30th power or 1024*1024*1024 (3 times). It is one step above megabyte and one below terabyte..
Global positioning system (GPS)	A system of 24 satellites created by the U.S. Department of Defense. The civilian receivers will identify a location to within about a few feet. Used for navigation, track vehicles, and plotting delivery routes.
Graphical user interface (GUI)	A system that is based on a graphics screen instead of simple text. Users perform tasks by clicking a mouse button on or manipulating objects on the screen. For example, copies are made by dragging an item from one location on the screen to another. Pronounced as “gooey.”
Grid computing	A system that networks multiple computers so that they cooperatively process the designated tasks, effectively functioning as a single computer.
Group breaks	Reports are often broken into subsections so that data in each section is grouped together by some common feature. For example, a sales report might group items by department, with subtotals for each department.
Group decision support system (GDSS)	A type of groupware that is designed to facilitate meetings and help groups reach a decision. Each participant uses a networked computer to enter ideas and comments. Votes can be recorded and analyzed instantly. Comments and discussion are automatically saved for further study.
Groupware	Software designed to assist teams of workers. There are four basic types: communication, workflow, meeting, and scheduling. The most common is communication software that supports messages, bulletin boards, and data

	file transfers and sharing.
Hacker	Primarily used to indicate a person who devotes a great deal of time trying to break into computer systems.
Hardware	The physical equipment used in computing.
High-bandwidth digital content protection (HDCP)	The digital rights management technology created by the movie and television industries to make it more difficult for people to copy high-definition TV signals. To play protected videos all of your equipment will need to support the HDCP standard.
High-Definition Television (HDTV)	Transmission of television signals in digital form. It provides clearer reception. It also supports encrypted transmissions so that broadcasters can control who receives the images. HDTV also supports compression, so that more data (better pictures or more channels) can be transmitted in the same frequency space.
Hot links	See dynamic integration.
Hot site	A facility that can be leased from a disaster backup specialist. A hot site contains all the power, telecommunication facilities, and computers necessary to run a company. In the event of a disaster, a company collects its backup data tapes, notifies workers, and moves operations to the hot site.
Hub	A network device used to connect several computers to a network. Commonly used in a twisted-pair LAN. A cable runs from each computer's NIC to the hub. The hub is often connected to a router.
Hypertext markup language (HTML)	The standard formatting system used to display pages on the Internet. Special tags (commands inside angle braces, e.g., <HTML>) provide formatting capabilities. Several software packages automatically store text in this format, so users do not have to memorize the tags.
Icon	A small picture on a computer screen that is used to represent some object or indicate a command. A classic example is the trash can used to delete files on the Apple Macintosh.
Import	An older method of exchanging data among various software packages. Most software (e.g., a database management system) can export or store data in a text file format. Another software package (e.g., a spreadsheet) can import or retrieve this data. Object Linking and Embedding is a more powerful way to exchange data.
Inference engine	Within an expert system, the inference engine applies new observations to the knowledge base and analyzes the rules to reach a conclusion.
Information	Data that has been processed, organized, and integrated to provide insight. The distinction between data and information is that information carries meaning and is used to make decisions.
Information center	An MIS group responsible for supporting end users. It typically provides a help desk to answer questions, programmers who provide access to corporate databases, training classes, and network support people to

	install and maintain networks.
Information rights management (IRM)	A system to control exactly what each group can do with digital data, including documents, music, and video files. A good IRM system can prevent a document from being read by outsiders, even if the document is somehow shipped outside the company's computers.
Information system	A collection of hardware, software, data, and people designed to collect, process, and distribute data throughout an organization.
Information technology (IT)	The hardware and software used to create an information system. Sometimes used as an abbreviation for management information systems.
Information threats	There are two classes of threats to information: (1) physical, in the form of disasters; and (2) logical, which consists of unauthorized disclosure, unauthorized modification, and unauthorized withholding of data. The primary source of danger lies with insiders: employees, ex-employees, partners, or consultants.
Information warfare (IW)	The use of information in a conflict setting. It includes protecting your own information, providing misinformation to the enemy, and monitoring and disrupting the enemy's information.
Inheritance	Creation or derivation of objects from other object classes. Each derived class inherits the attributes and methods of the prior class. For example, a savings account object can be derived from an account object. The savings account object will automatically have the same attributes and methods. Attributes and methods specific to the savings account can be added.
Initial public offering (IPO)	The step when firms first sell stock to the public. A method of raising additional funds and a major step for most start-up firms.
Input devices	People do not deal very well with binary data, so all data forms must be converted into binary form for the computer. Input devices—for example, keyboards, microphones, and bar code readers—make the conversion.
Input-Process-Output	A shorthand description of a subsystem. Each subsystem receives inputs and performs some process. The output is passed to another subsystem.
Instant Messaging (IM)	A two-way electronic communication in real time. Short comments that you type are immediately displayed on the recipient's screen. It generally requires that both parties run the same software.
Integrated data	The practice of combining data from different sources to make a decision. Data can come from different departments throughout the business, and it can come in many different forms. Networks, groupware, and products that support dynamic linking are all useful tools to integrate data to make better decisions.
Integrated Services Digital Network (ISDN)	A set of services, and a transmission and control system, offered by telephone companies. It uses complete digital transmission of signals to improve transmission speed and quality.
Intellectual	As defined by copyright laws, the concept that property such as music,

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property	books, software, and movies can be protected. The laws clearly define the owners of the property and specify that the owners can establish any type of copy protections they desire.
Internet	A collection of computers loosely connected to exchange information worldwide. Owners of the computers make files and information available to other users. Common tools on the Internet include e-mail, ftp, telnet, and the World Wide Web.
Internet service provider (ISP)	A private company that provides connections to the Internet. Individuals pay a fee to the ISP. The ISP pays a fee to a higher-level provider (e.g., NSP) to pass all communications onto the Internet.
Intranet	A network within an organization that utilizes standard Internet protocols and services. Essentially, this includes Web sites that are accessible only for internal use.
Iterative solution	Building a model and evaluating it until the parameter values converge to a fixed solution. Sometimes an iterative model will diverge and never reach an acceptable solution. See also circular reference.
Intrusion detection system (IDS)	A combination of hardware and software that monitors packets and operations on the network and computers. It watches for suspicious patterns that might indicate an attack.
Internet Protocol version 6 (IPv6)	A set of standards that define how raw data is transmitted on the Internet and how machines are addressed. Version 6 contains several improvements to the older version 4. For example, version 6 supports 128-bit addresses compared with 32 bits in version 4. It will take several years for people to move to version 6.
Kerberos	A security system created at MIT that enables systems to have a single sign-on. Users log into the Kerberos server and other systems can validate the user's identity from that server. Much simpler than requiring users to log in multiple times. Named after the hound that guards the gates of Hades (spelled Cerberus in Latin).
Kilobyte	Approximately one thousand bytes of data. Technically it is 2 to the tenth, or 1024. The next step up is megabyte.
Knowledge	A higher level of understanding, including rules, patterns, and decisions. Knowledge-based systems are built to automatically analyze data, identify patterns, and recommend decisions.
Knowledge base	Within an expert system, the knowledge base consists of basic data and a set of rules.
Knowledge engineer	A person who helps build an expert system by organizing the data, devising the rules, and entering the criteria into the expert system shell, trained to deal with experts to derive the rules needed to create an expert system. The engineer also converts the data and rules into the format needed by the expert system.



Knowledge Management (KM)	<p>A system that stores information in the context of a set of decisions. It contains cross-references and search methods to make it easy for workers to understand how and why decisions were made.</p> <p>The connection from an ISP to individual households and businesses. In many cases, the most difficult connection to make because of the cost and monopoly control. Most households are limited to a few choices: telephone and cable TV. Some technologies exist to run communications over power lines. The other option is wireless.</p>
Last mile	<p>The delay between initiating an action and seeing a result. In communications, it is the delay between sending a message and receiving a reply. Often a problem with satellite connections because the signal must travel huge distances.</p>
Latency	<p>Information systems that were created over several years and are now crucial to operating the company. They probably use older technology, and the software is difficult to modify. However, replacing them is difficult and likely to interfere with day-to-day operations. Any changes or new systems must be able to work with the older components.</p>
Legacy system	<p>A legal variation of organizing a company. It protects the owners with the same separation of funds offered to corporations, but because it does not allow it to issue stock, the record keeping is somewhat easier.</p>
Limited liability company (LLC)	<p>A collection of personal computers within a small geographical area, connected by a network. All of the components are owned or controlled by one company.</p>
Local area network (LAN)	<p>Magnetic hard drives (or disk drives) consist of rigid platters that store data with magnetic particles. Data is accessed by spinning the platters and moving a drive head across the platters to access various tracks.</p>
Magnetic hard drives	<p>A special typeface printed with ink containing magnetic ink. It can be read rapidly and reliably by computers. Banks are the primary users of MICR. Checks are imprinted with MICR routing numbers. MICR readers are more accurate than straight OCR because they pick up a stronger signal from magnetic particles in the ink.</p>
Magnetic ink character recognition (MICR)	<p>Programs that automatically read e-mail and sort the messages according to whatever criteria the manager prefers. Junk mail can be discarded automatically.</p>
Mail filters	<p>A generic term used to describe software that does nasty things. It includes viruses, Trojan Horses, spyware, and so on.</p>
Malware	<p>An MIS consists of five related components: hardware, software, people, procedures, and databases. The goal of management information systems is to enable managers to make better decisions by providing quality information.</p>
Management information system (MIS)	<p>An integrated approach to manufacturing. Beginning with the desired production levels, we work backward to determine the processing time,</p>
Manufacturing Resource	



Planning (MRP II)	materials, and labor needed at each step. These results generate schedules and inventory needs. Sometimes known as a demand-pull system.
Market basket analysis	A data mining technique pioneered to see if two items are commonly purchased at the same time. Can also be used to identify any pairs of items that are associated with each other.
Mass customization	The ability to modify the production line often enough to produce more variations of the main product. The goal is to cover virtually all of the niche markets.
Materials requirements planning (MRP)	An early production system, where at each stage of production, we evaluate the usage of materials to determine the optimal inventory levels.
Media	For transmissions, the means of connecting computers in a network. Common methods include twisted-pair and coaxial cable; fiber-optic lines; and radio, micro, and infrared waves.
Media access control (MAC)	The network protocol that governs how data bits are sent across a connection medium. Almost always implemented in a LAN card. It is most commonly noticed when you need to control security based on physical cards—in which case you need the MAC address that is uniquely assigned to every network interface card.
Megabyte	Loosely, 1 million bytes of data. Technically, it is 1,048,576 bytes of data, which is 2 raised to the 20th power or $1024 \times 1024$ . The next step up is gigabyte.
Megaflops	Millions of floating-point operations per second. A measure of the processor speed, it counts the number of common arithmetical operations that can be performed in one second.
Megahertz	One million cycles per second, a measure of the clock chip in a computer, which establishes how fast a processor can operate.
Metadata	Describes the source data, and the transformation and integration steps, and defines the way the database or data warehouse is organized.
Methods	Descriptions of actions that an object can perform. For example, an employee object could be hired, promoted, or released. Each of these functions would necessitate changes in the employee attributes and in other objects. The methods carry out these changes.
Microsecond	One-millionth of a second. Few computer components are measured in microseconds, but some electrical devices and controllers operate in that range. One microsecond compared to one second is the same as comparing one second to 11.6 days.
Million instructions per second (MIPS)	A measure of computer processor speed. Higher numbers represent a faster processor. However, different brands of processors use different instruction sets, so numbers are not always comparable.
Millisecond	One-thousandth of a second. Disk drives and some other input and output

	<p>devices perform operations measured in milliseconds. One millisecond compared to one second is the same as comparing 1 second to 16.7 minutes.</p>
Mirror drive	<p>A backup system where data is automatically written to a second disk drive. If the primary drive fails, operations can be switched instantaneously to the mirror drive.</p>
Model	<p>A simplified, abstract representation of some real-world system. Some models can be written as mathematical equations or graphs; others are subjective descriptions. Models help managers visualize physical objects and business processes. Information systems help you build models, evaluate them, and organize and display the output.</p>
Modem	<p>Modulator-demodulator. A device that converts computer signals into sounds that can be transmitted (and received) across phone lines.</p>
Morphing	<p>Digital conversion of one image into another. The term is an abbreviation of metamorphosis. True morphing is done with digital video sequences, where the computer modifies each frame until the image converts to a new form.</p>
Motherboard	<p>The main board in a computer that contains sockets for the process and RAM. It also contains an interface bus so that interface cards can be added to the system.</p>
Multimedia	<p>The combination of the four basic data types: text, sound, video, and images (animation). In its broadest definition, multimedia encompasses virtually any combination of data types. Today, it typically refers to the use of sound, text, and video clips in digitized form that are controlled by the computer user.</p>
Multitasking	<p>A feature of operating systems that enables you to run more than one task or application at the same time. Technically, they do not run at exactly the same time. The processor divides its time and works on several tasks at once.</p>
Nanosecond	<p>One-billionth of a second. Computer processors and memory chips operate at times measured in nanoseconds. One nanosecond compared to 1 second is the same as comparing 1 second to 31.7 years.</p>
Natural language	<p>A human language used for communication with other humans, as opposed to a computer programming language or some other artificial language created for limited communication.</p>
Network	<p>A set of items connected together. In MIS, it is typically a connection of computers. And social networks are connections of people.</p>
Network address translation (NAT)	<p>A network configuration where internal computers use non-routable addresses (usually in the 10.0.0.0 range). When connecting to devices on the Internet, the boundary router temporarily assigns a real IP address and then directs the incoming messages to the original computer by changing the address within the packets.</p>

Network attached storage (NAS)	A disk drive unit that stands alone and is connected to the high-speed local area network instead of directly to a single computer. Similar to a SAN but it uses standard network connections and is accessible to any computer attached to the network.
Network effect	The concept that a network becomes more valuable and useful as the number of participants increases. In social networks, larger networks attract more people, enabling them to grow even larger.
Network interface card (NIC)	The communication card that plugs into a computer and attaches to the network communication medium. It translates computer commands into network messages and server commands.
Network operating system (NOS)	A special operating system installed on a file server, with portions loaded to the client machines. It enables the machines to communicate and share files.
Network service provider (NSP)	A high-level Internet service provider offering connections to ISPs. The NSP leases high-speed, high-capacity lines to handle the communication traffic from hundreds of ISPs.
Neural network	A collection of artificial neurons loosely designed to mimic the way the human brain operates. Especially useful for tasks that involve pattern recognition.
Neuron	The fundamental cell of human brains and nerves. Each of these cells is relatively simple, but there are approximately 100 million of them.
Newsgroups	A set of electronic bulletin boards available on the Internet. Postings are continuously circulated around the network as people add comments.
Nondisclosure agreement (NDA)	A written agreement where the signer agrees to keep certain information confidential and not tell anyone. Commonly used by startup companies to keep basic technology, general operating practices, and marketing plans secret.
Normalization	A set of rules for creating tables in a relational database. The primary rules are that there can be no repeating elements and every non key column must depend on the whole key and nothing but the key. Roughly, it means that each table should refer to only one object or concept.
Numbers	One of the basic data types, similar to text on input and output. Attributes include precision and a scaling factor that defines the true size or dimension of the number.
Object	A software description of some entity. It consists of attributes that describe the object, and functions (or methods) that describe the actions that can be taken by the object. Objects are generally related to other objects through an object hierarchy.
Object hierarchy	Objects are defined from other base objects. The new objects inherit the properties and functions of the prior objects.
Object Linking and Embedding	A standard created by Microsoft for its Windows operating system to create compound documents and dynamically link data objects from

(OLE)	multiple software packages. You begin with a compound document or container that holds data from other software packages. These data objects can be edited directly (embedded). Most OLE software also supports dynamic linking.
Object orientation	An approach to systems and programming that classifies data as various objects. Objects have attributes or properties that can be set by the programmer or by users. Objects also have methods or functions that define the actions they can take. Objects can be defined from other objects, so most are derived from the four basic data types.
Object-oriented DBMS	A database system specifically created to hold custom objects. Generally supports developer-defined data types and hierarchical relationships.
Object-oriented design	The ultimate goal of the object-oriented approach is to build a set of reusable objects and procedures. The idea is that eventually, it should be possible to create new systems or modify old ones simply by plugging in a new module or modifying an existing object.
Object-oriented programming (OOP)	The process of writing software using sets of extensible objects. Programmers first create objects that encapsulate internal data structures with software methods. New objects can be created by inheriting properties and methods from more generic classes. A goal of OOP was to encourage reuse of objects to reduce the time it takes to create new applications.
Offshoring	The practice of sending jobs to an outside contractor located in a different country.
One-to-many relationship	Some object or task that can be repeated. For instance, a customer can place many orders. In database normalization, we search for one-to-many relationships and split them into two tables.
Online analytical processing (OLAP)	A computer system designed to help managers retrieve and analyze data. The systems are optimized to rapidly integrate and retrieve data. The storage system is generally incompatible with transaction processing, so it is stored in a data warehouse.
Open operating system	An operating system that is supposed to be vendor neutral. It should run on hardware from several different vendors. When a buyer upgrades to a new machine, the operating system and software should function the same as before.
Open source development	A method of creating software where the source code is released to the public and anyone can contribute to the project by writing sections of the code. Usually one person takes the lead to control the integration changes and planning for new releases. The Linux operating system initiated by Linux Thorvaldsen is a common example.
Open system	An open system learns by altering itself as the environment changes.
Operating system	A basic collection of software that handles jobs common to all users and programmers. It is responsible for connecting the hardware devices, such



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	as terminals, disk drives, and printers. It also provides the environment for other software, as well as the user interface that affects how people use the machine.
Operations level	Day-to-day operations and decisions. In a manufacturing firm, machine settings, worker schedules, and maintenance requirements would represent management decisions at the operations level. Information systems are used at this level to collect data and perform well-defined computations.
Optical character recognition (OCR)	The ability to convert images of characters (bitmaps) into computer text that can be stored, searched, and edited. Software examines a picture and looks for text. The software checks each line, deciphers one character at a time, and stores the result as text.
Optimization	The use of models to search for the best solutions: minimizing costs, improving efficiency, or increasing profits.
Output devices	Data stored in binary form on the computer must be converted to a format people understand. Output devices—for example, display screens, printers, and synthesizers—make the conversion.
Outsourcing	The act of transferring ownership or management of MIS resources (hardware, software and personnel) to an outside MIS specialist.
Packets	Network messages are split into packets for transmission. Each packet contains a destination and source address as well as a portion of the message.
Packet switching network	A communications protocol in which each message is placed into smaller packets. These packets contain a destination and source address. The packets are switched (or routed) to the appropriate computer. With high-speed switches, this protocol offers speeds in excess of 150 megabits per second.
Page footer	Data that are placed at the bottom of each page in a report. Common items include page totals and page numbers.
Page header	Data that is placed at the top of every page in a report. Common items include the report title, date, and column labels.
Parallel processing	Using several processors in the same computer. Each processor can be assigned different tasks, or jobs can be split into separate pieces and given to each processor. There are a few massively parallel machines that utilize several thousand processors.
Parameter	Variables in a model that can be controlled or set by managers. They are used to examine different situations or to tailor the model to fit a specific problem.
Patent	Legal protection for products (and sometimes business processes). It grants the owner sole right to sell or create modifications of the product for 20 years. No one can create the same product unless approved by the patent owner.



Peer-to-peer communication	<p>A method of sharing data and information directly with colleagues and peers, instead of transferring data through a shared central server.</p>
Peer-to-peer network	<p>A network configuration in which each machine is considered to be an equal. Messages and data are shared directly between individual computers. Each machine continuously operates as both a client and a server.</p>
Personal digital assistant (PDA)	<p>A small, portable handheld computer designed primarily to handle contacts, schedules, e-mail, and short notes. Some models have more advanced features to support documents, spreadsheets, photos, and music. A few have wireless connections; others have to be synchronized with desktops to transfer e-mail and update schedules. Replaced by smart phones.</p>
Phased implementation	<p>An implementation method that introduces the new system in phases or steps. One phase is completed before the next is undertaken. The pieces could be software components, different divisions, different locations, or a similar split.</p>
Phishing	<p>Pronounced as fishing. The act of sending out false messages, typically pretending to be from a bank, in an attempt to get users to provide usernames and passwords to access sensitive systems. Almost any e-mail message purportedly sent to you by a financial institution should be ignored. Anything that does not include your name should be deleted immediately.</p>
Photo-CD	<p>A standardized system created by Kodak to convert photographs to digital (bitmap) form and store them on optical disks.</p>
Pivot table	<p>A tool within Microsoft Excel used to extract and organize data. It enables users to examine aggregated data and quickly see the accompanying detail.</p>
Pixel	<p>Picture element, or a single dot on an image or video screen.</p>
Point of sale (POS) system	<p>A means of collecting data immediately when items are sold. Cash registers are actually data terminals that look up prices and instantly transmit sales data to a central computer.</p>
Polymorphism	<p>In an object design, different objects can have methods that have the same name but operate slightly differently. For example, a checking account object and a savings account object could each have a method called pay interest. The checking account might pay interest monthly, whereas the savings account pays it quarterly.</p>
Portable document format (PDF)	<p>A file format often used on the Internet. It can display documents with detailed precision, including special fonts and shading. Defined by Adobe, readers are freely available for many machines. Special software must be purchased to create the files.</p>
Precision (numeric)	<p>In computers, numeric precision represents the number of digits stored to the right of the decimal point. So, 10.1234 is more precise than 10.12;</p>

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	however, it is not necessarily more accurate. The original value might not have been measured beyond two digits.
Prediction	Model parameters can be estimated from prior data. Sample data is used to forecast future changes based on the model.
Primary key	A column or set of columns that contains data to uniquely identify each row in a relational database table. For example, each customer must have a unique identifier, possibly a phone number or an internally generated customer number.
Privacy	(1) The concept that people should be able to go about their lives without constant surveillance, that personal information about people should not be shared without their permission. (2) Collecting personal data only when you have a legitimate use for it, allowing customers to correct and remove personal data. Protecting confidential data so that it is not released to anyone. Giving customers the option so that you do not sell or lease their personal data.
Private key	In a dual-key encryption system, the key that is protected by the owner and never revealed. It is generally a very large number.
Problem boundary	The line that identifies the primary components of the system that are creating a specific problem. Subsystems inside the boundary can be modified to solve the problem or enhance the system. Subsystems outside the boundary cannot be altered at this time.
Procedures	Instructions that help people use the systems. They include items such as user manuals, documentation, and procedures to ensure that backups are made regularly.
Process	An activity that is part of a data flow diagram. Systems can be built to process goods or to process data. Most information system work focuses on processes that alter data.
Process control	The use of computers to monitor and control the production machines and robots. Production lines generally use many different machines, each requiring several adjustments or settings. Computer control simplifies and speeds the setup.
Process innovation	Evaluating the entire firm to improve individual processes, and to search for integrated solutions that will reduce costs, improve quality or boost sales to gain a competitive advantage. See also reengineering.
Processor	The heart of a computer. It carries out the instructions of the operating system and the application programs.
Product differentiation	The ability to make your products appear different from those of your rivals, thus attracting more customers. Information systems have been used to alter products and provide new services.
Protect document	A method of restricting changes to Microsoft Office files. A limited version of information rights management that will allow people to read a document but not make changes.

Protocols	A set of definitions and standards that establish the communication links on a network. Networks are often classified by their choice of protocol. Common protocols include Ethernet, Token Ring, and TCP/IP.
Pseudo code	A loosely structured method to describe the logic of a program or outline a system. It uses basic programming techniques but ignores issues of syntax and relies on verbal descriptions.
Public key	In a dual-key encryption system, the key that is given to the public. Each person wishing to use dual-key encryption must have a different public key. The key works only in tandem with the user's private key.
Query by example (QBE)	A visual method of examining data stored in a relational database. You ask questions and examine the data by pointing to tables on the screen and filling in templates.
Query system	A method of retrieving data in a DBMS. It generally uses a formal process to pose the questions (1) what columns should be displayed? (2) what conditions are given? (3) what tables are involved? and (4) how are the tables connected? See query by example and SQL.
Radio frequency identification (RFID)	Small, passive computer chips that are powered by radio waves. When triggered by a reader, the chip returns data stored in its memory by modulating the radio signals. Readable range is limited to a few feet or less. If price drops far enough, they might replace bar codes.
Random access memory (RAM)	High-speed memory chips that hold data for immediate processing. On most computers, data held in RAM is lost when the power is removed, so data must be moved to secondary storage.
Rapid application development (RAD)	The goal of building a system much faster than with traditional SDLC methods. Using powerful tools (database management system, high-level languages, graphical toolkits, and objects), highly trained programmers can build systems in a matter of weeks or months. Using workgroups, communication networks, and CASE tools, small teams can speed up the development and design steps.
Read Only Memory (ROM)	A type of memory on which data can be stored only one time. It can be read as often as needed but cannot be changed. ROM keeps its data when power is removed, so it is used to hold certain core programs and system data that is rarely changed.
Really simple syndication (RSS)	A technique used with blogs to automatically push new versions down to subscribers. Users can configure a Web browser to connect to a favorite blogger. New versions are automatically displayed on the browser.
Redundant array of independent Disks (RAID)	A system consisting of several smaller drives instead of one large drive. Large files are split into pieces stored on several different physical drives. The data pieces can be duplicated and stored in more than one location for backup. RAID systems also provide faster access to the data, because each of the drives can be searching through their part of the file at the same time.

Reengineering	A complete reorganization of a company. Beginning from scratch, you identify goals along with the most efficient means of attaining those goals, and create new processes that change the company to meet the new goals. The term reengineering and its current usage were made popular in 1990 by management consultants James Champy and Michael Hammer.
Relational database	A database in which all data is stored in flat tables that meet the normalization rules. Tables are logically connected by matching columns of data. System data—such as access rights, descriptions, and data definition—are also stored in tables.
Replay attack	If an attacker captures a set of network transmissions, the attacker could replay those same messages by sending them again to gain access to a server or duplicate a financial transaction.
Replication	The intentional process of duplicating data in a database so that it can be transported and accessed in multiple locations. The DBMS has the ability to synchronize data changes between the master copy and any replicas.
Report	A printed summary or screen display that is produced on a regular basis by a database management system. The main sections of a report are report header, page header, group/break header, detail, group/break footer, page footer, and report footer.
Request for proposal (RFP)	A list of specifications and questions sent to vendors asking them to propose (sell) a product that might fill those needs.
Resolution	The number of dots or pixels displayed per inch of horizontal or vertical space. Input and output devices, as well as images and video, are measured by their resolution. Higher values of dots per inch yield more detailed images.
Reusability	The ultimate goal of object-oriented systems. By defining an object up front and storing it in a repository the object can be used in many applications, instead of requiring developers to recreate it every time a new system is built.
Router	A communication device that connects sub networks together. Local messages remain within each sub network. Messages between sub-networks are sent to the proper location through the router.
Row	A horizontal element that contains all of the data to describe an entity or object in a relational database or spreadsheet.
Rules	A set of conditions that describe a problem or a potential response. Generally expressed as “If... Then” conditions. Used by expert systems to analyze new problems and suggest alternatives.
Sampler	An input device that reads electrical signals from a microphone and stores the sound as a collection of numbers. It measures the frequency and amplitude of the sound waves thousands of times per second.
Scalability	The ability to buy a faster computer as needed and transfer all software



	and data without modification. True scalability enables users to buy a smaller computer today and upgrade later without incurring huge conversion costs.
Scrolling region	On a data entry form, a subform or section that is designed to collect multiple rows of data. Much like a spreadsheet, the user can move back and forth to alter or examine prior entries.
Search engine optimization	A practice of making a Web site more compatible with search engines. The goal is to make the page appear higher in the list of results when users search for the desired topic. Most good SEO techniques define the page precisely so that it matches exactly how a person perceives the page. Black hat or bad SEO methods try to trick the search engine—which usually results in the site being blacklisted by the search engine.
Secondary storage	Data storage devices that hold data even if they lose power. Typically cheaper than RAM, but slower. Disk drives are common secondary storage devices.
Secure sockets layer (SSL)	A system that provides encryption for Internet transmissions. Commonly used to establish a secure connection between client browsers and e-commerce servers. It is established with dual-key encryption by installing a digital security certificate on the server.
Serifs	The small lines, curlicues, and ornamentation on many typefaces. They generally make it easier for people to read words and sentences on printed output. Sans serif typefaces have more white space between characters and are often used for signs and displays that must be read from a longer distance.
Server farm	A collection of dozens or hundreds of smaller servers. Software allocates tasks to whichever server is the least busy. This approach to scalability is fault-tolerant and easy to expand, but can be difficult to manage.
Service level agreement (SLA)	A formal written agreement between a user group and a service provider that specifies guaranteed levels of service and compensation for failure to meet those levels. SLAs are commonly used in outsourcing deals to ensure the contracted party is providing adequate levels of service, particularly with network providers.
SharePoint	Microsoft's Web-based tool for teamwork. It supports file sharing, version control, discussion groups, and surveys.
Sign-off	In a systems development life-cycle approach, the approval that managers must give to forms, reports, and computations at various stages of the development. This approval is given when they sign the appropriate documents.
Simple object access protocol (SOAP)	A standard, easy-to-implement method of exchanging information and messages among different computers on the Internet. A protocol that works with XML to support Web-based services.
Simulation	Models are used to examine what might happen if we decide to make



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	changes to the process, to see how the system will react to external events, or to examine relationships in more detail.
Single sign-on	A comprehensive security authentication system so that users can log in (sign on) one time. Once the user's identity has been established, all applications obtain the credentials from a central server to recognize the user and determine access rights.
Social networking	Contacts with friends and businesspeople. Many Web sites such as Face book, Flickr, and YouTube were built to support social networking—enabling users to find each other and share information online.
Software	A collection of computer programs that are algorithms or logical statements that control the hardware.
Software maintenance	The act of fixing problems, altering reports, or extending an existing system to improve it. It refers to changes in the software, not to hardware tasks such as cleaning printers.
Software piracy	The act of copying software without paying the copyright owner. With few exceptions (e.g., backup), copying software is illegal. Companies and individuals who are caught have to pay thousands of dollars in penalties and risk going to jail. It is commonly accepted that piracy takes money away from the development of improved software.
Software suites	Collections of software packages that are designed to operate together. Theoretically, data from each package can be easily shared with data from the others. So word processors can incorporate graphics, and spreadsheets can retrieve data from the database management system. Suites are often sold at a substantial discount compared to buying each package separately.
Solid state drive	A disk drive replacement or data storage mechanism that uses electronic components to store data instead of a movable platter. Most SSDs are similar to flash drives but with greater capacity and faster data transfer speeds.
Speech recognition	The ability of a computer to capture spoken words, convert them into text, and then take some action based on the command.
SQL	A structured query language supported by most major database management systems. The most common command is of the form: SELECT column list FROM table list JOIN how tables are related WHERE condition ORDER BY columns.
Standard operating procedures	A set of procedures that define how employees and managers should deal with certain situations.
Standards	An agreement that specifies certain technical definitions. Standards can be established by committees or evolve over time through market pressures. As technology changes, new standards are created.

Static HTML	Simple HTML pages that are changed only by humans, so they are rarely changed. Generally used only for the repurchases information stage of e-commerce.
Static integration	A means of combining data from two documents. A copy of the original is placed into the new document. Because it is static, changes made to the original document are not automatically updated. See also dynamic integration.
Statistical quality control (SQC)	The statistical analysis of measurement data to improve quality. Several statistical calculations and graphs are used to determine whether fluctuations are purely random or represent major changes that need to be corrected.
Storage area network (SAN)	A method of storing computer data on devices attached to a high-speed local connection instead of placing them into each computer. Separating data from the computer and centralizing it makes it easier to upgrade, control, and provide backups. Fiber optic connections are often used for SAN drives.
Strategic decisions	Decisions that involve changing the overall structure of the firm. They are long-term decisions and are unstructured. They represent an attempt to gain a competitive advantage over your rivals. They are usually difficult and risky decisions. MIS support for strategic decisions typically consists of gathering, analyzing, and presenting data on rivals, customers, and suppliers.
Structured decisions	Decisions that can be defined by a set of rules or procedures. They can be highly detailed, but they are defined without resorting to vague definitions.
Structured walkthrough	A review process in which the objective is to reveal problems, inaccuracies, ambiguities, and omissions in the system's design before the program code is finalized. The users are presented with a prototype or mockup of the proposed system.
Subchapter S corporation	A legal variation of a corporation that can be chosen by the owners. The IRS and some states impose limits on the type of company that can elect this option. It avoids the problem of double taxation by passing income and losses directly to the owners' personal income tax statements.
Supply chain management (SCM)	Organizing the entire supply process including vendor selection, parts management, ordering, tracking, payment, and quality control.
Syntax	The set of command words, symbols, and punctuation used by a computer programming language. When writing programs, you must type the exact words and symbols so the computer understands what you want it to do. See also programming logic.
Synthesizer	An electronic device to convert electrical signals into sound. One basic technique is FM synthesis, which generates and combines fixed waves to

	achieve the desired sound. A newer method combines short digitized samples of various instruments with waveforms to create more realistic sounds.
System	A collection of interrelated objects that work toward some goal.
Systems analysis and design	A refinement of the scientific method that is used to analyze and build information systems.
Systems analyst	A common job in MIS. The analyst is responsible for designing new systems. Analysts must understand the business application and be able to communicate with users. Analysts must also understand technical specifications and programming details.
Systems development life cycle (SDLC)	A formal method of designing and building information systems. There are five basic phases: (1) feasibility and planning, (2) systems analysis, (3) systems design, (4) implementation, and (5) maintenance and review.
Table	A method of storing data in a relational database. Tables contain data for one entity or object. The columns represent attributes, and data for each item is stored in a single row. Each table must have a primary key.
Tactical decisions	Tactical decisions typically involve time frames of less than a year. They usually result in making relatively major changes to operations but staying within the existing structure of the organization. MIS support consists of databases, networks, integration, decision support systems, and expert systems.
Telnet	A method supported on the Internet that enables users of one computer to log on to a different computer. Once logged on to the new system, the user is treated as any other user on the system.
Table	The basic method of storing data in a DBMS. Each table represents one object or entity. Relational databases require that tables be defined following specific data normalization rules.
Template	A method of creating objects such as forms, reports, and Web sites to ensure that they follow the same format. A designer creates a template and all objects follow those design standards.
Terabyte	Approximately 1 trillion bytes of data. Technically, it is 2 to the 40th power or $1024 \times 1024 \times 1024 \times 1024$ (4 times). The step lower is gigabyte, the step above is petabyte.
Text	The simplest of the four basic data types, it also includes numbers. In its most basic form, text is made up of individual characters, which are stored in the computer as numbers. More sophisticated text is described by its typeface, font size, color, and orientation (rotation).
Time division multiplexing (TDM)	A method of sharing a communication medium with multiple users where each computer is allowed to send data for a specified amount of time, then releases it to the next computer. Typically handled by requiring devices to send short packets of data.

Token Ring	A communications protocol that describes when each machine can send messages. A machine can transmit only when it receives a special message called a token. When the message is finished or a time limit is reached, the token is passed to the next machine.
Top-down development	An approach to designing and building systems that begins with an analysis of the entire company and works down to increasing detail. A complete top-down approach is usually impossible because it takes too long to analyze everything. See also bottom-up development.
Total quality management (TQM)	A management doctrine stating that quality must be built into every process and item. Every step and each person must be dedicated to producing quality products and services.
Transaction-processing system	A system that records and collects data related to exchanges between two parties. This data forms the foundation for all other information system capabilities. MIS support typically consists of databases, communication networks, and security controls.
Transborder data flow (TBDF)	The transfer of data across national boundaries. Some countries place restrictions on the transfer of data, especially data that relates to citizens (and, of course, data related to “national security”). Some people have discussed taxing the flow of data.
Transmission medium	The physical method of connecting communication devices. The most common media in use are electrical wires, fiber optics, and radio or micro waves.
Triggered rule	In an expert system, if a rule is used in an application, it is said to have been triggered or fired.
True color	Humans can distinguish about 16 million colors. Devices that can display that many colors are said to display true color. It requires the device to use 3 bytes (24 bits) for each pixel.
Turing test	A test proposed by Alan Turing in which a machine would be judged “intelligent” if the software could use conversation to fool a human into thinking it was talking with a person instead of a machine.
Turn-key systems	Computer application systems designed for a specific task that can be installed easily. Common examples include applications for specific types of businesses, such as a system for physicians or dentists.
Twisted-pair cable	Common dual-line wire. Often packaged as three or four pairs of wires. The cable can be run for only a limited distance, and the signal is subject to interference.
Two-factor authentication	A login process that requires two types of systems for identifying users. The most common examples are: (1) username/password, and (2) a generator card that creates a random number every minute that is synchronized to the central computer.
Typeface	A defined way to draw a set of text characters. Several thousand typefaces have been created to meet different artistic and communication needs. A



	common characterization is serif and sans serif typefaces.
Ultra-wideband (UWB)	A wireless communication protocol that is radically different from other wireless systems. Designed for short range, the system uses very low power but very high frequency bandwidth. The low power enables it to be invisible to existing applications, so it can use large amounts of bandwidth to send multiple bits of data at the same time—transmitting in parallel form it can quickly send large files. Proposed as a replacement for physical connection cables, particularly video connectors.
Unicode	An international standard that defines character sets for every modern (living) language and many extinct languages (e.g., Latin).
Uninterruptable power supply (UPS)	A large battery and special circuitry that provide a buffer between the computer and the power supply. It protects the computer from spikes and brownouts.
Universal description, discovery, and integration (UDDI)	A public Web-based directory system designed to enable computers to find and use Web services offered by other companies. For example, someday your computer could automatically find all companies that can use current exchange rates to convert prices.
UNIX	A popular operating system created by Bell Labs. It is designed to operate the same on hardware from several different vendors. Unfortunately, there are several varieties of UNIX, and software that operates on one version often must be modified to function on other machines.
Unstable model	A model that cannot be solved for a single solution. The solution might continually diverge, or it could oscillate between several alternatives, generally due to insufficient or incorrect feedback mechanisms.
Upload	To transfer files from a local computer (usually a personal computer) to a distant computer. See also download.
Usenet	See newsgroups.
User resistance	People often resist change. Implementation of a new system highlights this resistance. Managers and developers must prepare for this resistance and encourage users to change. Education and training are common techniques.
Value chain	A description of the many steps involved in creating a product or service. Each step adds value to the product or service. Managers need to evaluate the chain to find opportunities to expand the firm and gain more sales and profits.
Version control	Software that tracks changes made to other documents. Often used in software development to enable developers to go back to prior version. It is also available for common business documents and files. A limited version is embedded into Microsoft Word.
Video	One of the basic data types. Video combines the attributes of images and sound. An important attribute is the frames per second definition. U.S.



		standard video operates at 30 frames per second, movie films run at 24 frames per second. Digitizing video requires capturing and playing back the frames at the appropriate speed.
View		A stored query. If you have a complex query that you have to run every week, you (or a database specialist) could create the query and save it as a view with its own name. It is then treated much like a simple table.
Virtual machine (VM)	machine	A software-based definition of a computer that is stored and run on top of a physical computer. A single physical computer can host several VMs. Physical processors, RAM, disk space, and network connections are shared among the VMs. Generally, the physical elements can be reallocated to whichever VM currently needs more capacity.
Virtual mall		A collection of Web-based merchants who join together for marketing purposes. Generally they share a common Web host and the same commerce server software. By sharing costs, they can survive without a huge amount of sales.
Virtual network (VPN)	private	Software installed on a company network and on each client that automatically encrypts all communications between the two; useful when workers travel or need to reach the company servers from home using the Internet.
Virtual (VR)	reality	Virtual reality describes computer displays and techniques that are designed to provide a realistic image to user senses, including three-dimensional video, three-dimensional sound, and sensors that detect user movement that is translated to on-screen action.
Virus		A malicious program that hides inside another program. As the main program runs, the virus copies itself into other programs. At some point, the virus displays a message, shuts down the machine, or deletes all of the files.
Visual Basic		A modern variation of the BASIC programming language created by Microsoft for application programming in Windows. A variation resides inside many of the Microsoft applications, enabling programmers to manipulate and exchange data among the database, spreadsheet, and word processor.
Visual table contents	of	A graphical design method that shows how modules of a system are related. Versions of the technique are also used to display menu trees.
Voice mail		A messaging system similar to telephone answering machines but with additional features like message store and forward. You can use your computer to send messages to coworkers. There are tools that will read e-mail and fax messages over the phone, so managers can stay in touch while they are away from the computer.
Voice Internet (VoIP)	over protocol	Connecting telephones to the network and using the Internet to transfer phone conversations—instead of traditional phone lines.

Voice recognition	The ability of a computer to capture spoken words and convert them into text.
Web 2.0	A second generation of Web sites—dedicated to providing shared services such as the social networking sites. The term is not precisely defined and people disagree on what to include, but it excludes first-generation text and EC sales sites.
Webmaster	Specialized IS worker who is responsible for creating, maintaining, and revising a company's World Wide Web site. Webmasters use technical and artistic skills to create sites that attract browsers.
Wide area network (WAN)	A network that is spread across a larger geographic area. In most cases, parts of the network are outside the control of a single firm. Long-distance connections often use public carriers.
WiFi	Short for wireless fidelity. An early protocol for defining wireless connections, commonly used in homes and businesses. It has a relatively short range (perhaps 100 meters). Transfer speeds initially were less than 11 mbps (using 802.11b), but have increased to 54 mbps (802.11a and 802.11g), and are potentially up to 100 or 200 mbps (802.11n). The higher speeds are achieved by using multiple frequencies at the same time. Actual speeds are considerably lower (as low as half the rated maximum).
Wiki	A Web site designed to enable multiple people to create and revise content. The most famous is Wikipedia where anyone can create encyclopedic entries. The tools can be used for business teamwork applications.
Window	A portion of the computer screen. You can move each window or change its size. Windows enable you to display and use several applications on the screen at one time.
Wisdom	A level above knowledge. Wisdom represents intelligence, or the ability to analyze, learn, adapt to changing conditions, and create knowledge.
Workflow software	A type of groupware that is designed to automate forms handling and the flow of data in a company. Forms and reports are automatically routed to a list of users on the network. When each person adds comments or makes changes, it is routed to the next process.
Workstations	Computers attached to a network, designed for individual use. Typically, personal computers.
<b>Zero-day attacks</b>	Attacks on computers that are based on flaws found in software that have not yet been patched. The zero-day means attackers found the flaw before or simultaneously with security researchers.
<b>WYSIWYG</b>	What you see is what you get. With a true WYSIWYG system,

documents will look exactly the same on the screen as they do when printed. In addition to format, it means that the printer must have the same typefaces as the video display. Color printers use a system to match the colors on the monitor.

<b>Application generator</b>	A software tool for developers that helps build software applications. It is usually associated with a DBMS but several standalone tools exist to help create new forms and reports.
<b>Wi-Max</b>	A wireless technology designed for relatively high speeds and medium distances—up to several kilometers. It can support point-to-point transmissions to create high-speed Internet connections to service providers, or multipoint systems to handle many users at the same time. Clear wire and Sprint led the way at installing the technology in the U.S. and joined forces in 2007.
<b>Videoconference</b>	A meeting tool that transmits images and sound of at least one participant. Often, video cameras are available to everyone involved in the conference. High-end systems enable the participants to control the cameras.
<b>Vector image</b>	A stored collection of mathematical equations, representing lines, circles, and points. These equations can be rescaled to fit any output device or to any desired size. Users deal with the base objects, not the mathematical definitions.
<b>Trojan Horse</b>	A special program that hides inside another program. Eventually, when the main program is run, the Trojan Horse program might delete files, display a message, or copy data to an external computer.
<b>Thin client</b>	Simpler hardware than a full-blown personal computer, with minimal software. It is generally used to display applications running on the server and to accept input from the user.
<b>Telepresence</b>	A large, high-resolution video conferencing system that has the goal of providing a distance meeting as comfortable as in person.
<b>Synchronization</b>	A method of sending data from multiple computers to provide up-to-date data on both computers. Data changes are sent to each computer participating in the synchronization process to ensure each participant has the same set of data.
<b>Switch</b>	A network device used to connect machines. Unlike a router, a switch creates a virtual circuit that is used by a single machine at a time.
<b>Spyware</b>	Software that stealthily installs itself on your computer, records your activities or keystrokes. Commonly used by attackers who collect the data to learn your account passwords. Extremely dangerous because once installed it can gain total access to your system. Software scanning tools can spot most common spyware programs. Windows Vista has other tools to prevent programs from installing themselves without your knowledge.
<b>Spam</b>	Unsolicited commercial e-mail, or junk mail. Unwanted messages sent by commercial entities or hackers trying to steal your system or your money. It makes up over 50 percent of e-mail traffic. Most nations have made it illegal, but

		it is hard to stop. The name refers to a Hormel meat product, but its use is often attributed to a Monty Python sketch.
<b>Social engineering</b>		A method used by attackers to obtain usernames and passwords to obtain illegal access to a system. An attacker might call a user and pretend to be a system administrator asking for confirmation of a password. Relatively easy to stop by never telling your password to anyone. Systems administrators will never need your password.
<b>Script kiddies</b>		A lazy attacker who downloads code from the Internet to attempt to find and exploit known holes. Can be stopped by ensuring your software contains all current patches.
<b>Scope creep</b>		The process in any project where people keep trying to add new features to the project. An easy way to drive a project out of control. As the number of features added begins to exceed the original plan, the costs increase and the project is delayed.
<b>Reduced instruction set computer (RISC)</b>		When designing a RISC processor, the manufacturer deliberately limits the number of circuits and instructions on the chip. The goal is to create a processor that performs a few simple tasks very fast. More complex problems are solved in software. Because RISC processors require fewer circuits, they are easier to produce.
<b>Prototyping</b>		An iterative system design technique that takes advantage of high-level tools to rapidly create working systems. The main objective of prototyping is to create a working version of the system as quickly as possible, even if some components are not included in the early versions.
<b>Pure Internet plays</b>		Dot-com firms that have no direct tie to traditional business. Firms that make all their revenue from Internet sales or other Internet firms. A popular concept in 1999, but most pure Internet firms failed in 2000 and 2001.
<b>Pretty good privacy (PGP)</b>		A dual-key encryption system based on the Diffie-Hellman approach similar to RSA. Created by Philip Zimmermann and commonly used to encrypt e-mail. Free copies for noncommercial use are still available from MIT.
<b>Podcast</b>		An audio message distributed via a Web site designed for storage and playback on an Apple iPod. But the term today includes almost any type of audio file containing messages.
<b>Online transaction processing (OLTP)</b>		A computer system designed to handle daily transactions. It is optimized to record and protect multiple transactions. Because it is generally not compatible with managerial retrieval of data, data is extracted from these systems into a data warehouse.
<b>Near-field communication (NFC)</b>		A very short range wireless communication method useful for touch less payments because the short range makes it difficult to intercept the transmission or misidentify the sender. Typically a range of a few centimeters with a relatively low bandwidth. Similar to RFID, but with a shorter range.
<b>Joint application design (JAD)</b>		A method to reduce design time by putting everyone in development sessions until the system is designed. Users, managers, and systems analysts participate in a series of intense meetings to design the inputs (data and screens) and outputs



(reports) needed by the new system.

<b>Internet Engineering Task Force (IETF)</b>	The primary technical committee that defines Internet standards. It is responsible for standards such as router protocols and HTML.
<b>Extensible markup language (XML)</b>	A tag-based notation system that is used to assign names and structure to data. It was mainly designed for transferring data among diverse systems.
<b>Cut, copy, paste</b>	A common mechanism used to transfer and link data between different software packages. The data to be transferred is marked. When it is cut or copied, it is placed on the clipboard. Switching to the second package, the object is pasted into the appropriate location. Dynamic and static links are specified through options in the “paste special” menu. With the cut option, the original object is deleted. With copy, the original is unchanged.
<b>Common Object Request Broker Architecture (CORBA)</b>	A model largely developed in the UNIX community that will enable objects to communicate with each other across networks. In particular, it is designed to enable users to combine different data types from various software vendors into a single compound document. The data could reside on any server on the network.

### IMPORTANT POINTS



## MULTIPLE CHOISE QUESTIONS

1. A system analyst designs a new system by:
  - (a) Adopting a developed system to the present environment
  - (b) Developing the system as a large, single unit
  - (c) **Identifying subsystems and interfaces between subsystems**
  - (d) None of the above( )
  
2. A feasibility study:
  - (a) **Includes a statement of the problem**
  - (b) Considers a single solution
  - (c) None of the above
  - (d) both a and b( )
  
3. In top down analysis and design:
  - (a) **Each succeeding phase is more detailed than the phase before it.**
  - (b) Each succeeding phase is less detailed than the phase before it.
  - (c) Each succeeding phase is as detailed as the phase before it.
  - (d) None of the above( )
  
4. Which of the following is a medium for transporting the output of a system of the input of another system?
  - (a) **Feedback**
  - (b) Boundary
  - (c) Interface
  - (d) Counter measure( )
  
5. In what manner, coding and testing are done?
  - (a) **Top-down**
  - (b) Bottom up
  - (c) Cross sectional
  - (d) Ad hoc( )
  
6. To run the old system and the new system at the same time for specified period, the system implementation approach used is:
  - (a) Phased
  - (b) Pilot
  - (c) **Parallel**
  - (d) Direct( )
  
7. The first step to the system study project is do:
  - (a) Define system performance criteria
  - (b) **Describe information needs**
  - (c) Announce the study project
  - (d) Staff for the study project( )
  
8. A system's revision can be resulted because of:
  - (a) Desire for more business
  - (b) Changes in laws

- (c) A need for more time (d) **All of the above** ( )
9. A decision table:  
(a) **Documents rules that select one or more actions based on one or more conditions from a set of possible conditions**  
(b) Represents an information flow  
(c) Shows the decision paths  
(d) Gets an accurate picture of the system ( )
10. System prototyping helps the designer in:  
(a) Communicating to the user, quickly, how the system, when developed will look and get a feedback  
(b) Making the programmers understand how the system will work  
(c) Giving the demonstration of the software to the system manager  
(d) **All of the above** ( )
11. The MIS should be developed by:  
(a) The manager  
(b) The information specialist  
(c) **Both a and b**  
(d) Neither a nor b ( )
12. A chart comprised of bars, each representing a period of time, is called a:  
(a) Cent chart (b) Gantt chart  
(c) **Both a and b** (d) Grand chart ( )
13. During the MIS development process, progress reporting meetings are held:  
(a) Daily  
(b) Weekly  
(c) Monthly  
(d) **Only on an 'as needed' basis** ( )
14. Computer information systems are most successful in providing information for:  
(a) **Control decisions** (b) Planning decision  
(c) Strategic decision (d) None of the above ( )
15. Which of the following is considered to be an interface between functional applications and the database?  
(a) Management Information System  
(b) **Database Management System**  
(c) Data Processing System  
(d) None of the above ( )
16. Which of the following is generally true about management reports?

- a
- (a) Low level managers need information in the form of detailed report
  - (b) Reports can be issued on demand periodically, or on the occurrence of specific event
  - (c) Middle managers use exception reports
  - (d) **All of the above** ( )
17. A greater proportion of time is spent in planning on the :
- (a) **Top management**
  - (b) Middle management level
  - (c) Lower management level
  - (d) None of the above ( )
18. A central purpose of most decision support system is:
- (a) **to build a model of the decision making problem**
  - (b) to design a database management system
  - (c) to build an expert system
  - (d) None of the above ( )
19. Which of the following is not a key component of the evaluation process in building a DSS?
- (a) Criteria for evaluation
  - (b) Means of measuring system development time spent on the project
  - (c) **Means of monitoring the progress of the DSS**
  - (d) Formal review process ( )
20. Logical models from the basis for computing system that generate information useful in dealing with:
- (a) Uncertain situation
  - (b) Complex situation
  - (c) Dynamic situations
  - (d) **All of the above** ( )
21. The selection of the solution technique to be implemented by a computing system should be made by:
- (a) **System analysis**
  - (b) An operations research expert
  - (c) A computer programmer
  - (d) A computing system user ( )
22. MRP stands for:
- (a) Marketing research planning
  - (b) Management resources planning
  - (c) Manufacturing resources planning
  - (d) **Material requirement planning** ( )
23. A periodic report can be used to:
- (a) **Identify the problem**

- (b) Identify solution  
(c) Evaluate solutions  
(d) Select solution ( )
24. An periodic report can be used to:  
(a) Aged account receivable report  
(b) Overtime earnings report  
(c) **Both a and b**  
(d) neither a and b ( )
25. An EQQ formula is an example of a(n):  
(a) Static model  
(b) **Optimizing model**  
(c) Deterministic model  
(d) All of the above ( )
26. Linear programming identifies:  
(a) The optimum identifies  
(b) The maximum profit of minimum cost that can be expected  
(c) **both a and b**  
(d) Neither a and b ( )
27. The two functional areas concerned with materials flow are:  
(a) Production and marketing  
(b) **Manufacturing and purchasing**  
(c) Marketing and finance  
(d) Manufacturing and finance ( )
28. Data collection terminals:  
(a) Record employee attendance  
(b) Track the flow of materials from one production area to another  
(c) Record start and stop of production steps  
(d) **All of the above** ( )
29. A system can be composed of more than one:  
(a) **Subsystem** (b) Element  
(c) Super system (d) None of the above ( )
30. The computer is a part of the firm's:  
(a) **Physical system** (b) Conceptual System  
(c) Locking (d) Neither a nor b ( )
31. Encryption is being used primarily with:  
(a) Transaction Entry (b) Computer Processing  
(c) File retention (d) **Data communication** ( )

32. PERT and CPM are:  
(a) Network techniques (b) Assignment technique  
(c) **Project evaluation techniques** (d) None of the above ( )
33. Zani's framework of effective MIS argues that MIS can only be designed in:  
(a) Top down techniques (b) Coordinate fashion  
(c) Bottoms up (d) **By managerial participation**  
( )
34. A transportation problem in which the total supply available at the origins exactly satisfies the total demand required at the destinations is known is:  
(a) Degenerate solution  
(b) **Balance transpiration problem**  
(c) Unbalance transpiration problem  
(d) All of the above ( )
35. The funds managements subsystems attempt to:  
(a) Increase case input (b) Decrease cash input  
(c) **Balance cash inflow with outflow** (d) All of the above ( )
36. Management has become more complex because:  
(a) There is less time to react to competitive actions  
(b) The equipment used in many of the firm's activities has become more complex  
(c) Firms have become larger  
(d) **All of the above** ( )
37. Marketing planning is concerned with:  
(a) Planning the amount and placement of newspaper  
(b) Planning consignment sale contract to be offered  
(c) Planning sales force size and deployment  
(d) **All of the above** ( )
38. The marketing mix does not include:  
(a) **Place** (b) Product  
(c) Persuasion (d) Promotion ( )
39. A quotation system obtains potential delivery time data from the:  
(a) Production schedule file (b) **Inventory**  
(c) Product (d) All of the above ( )
40. One of the purchase order system's procedure sets is:  
(a) Automatic purchase order writing (b) Receiving  
(c) **Account payable** (d) None of the above ( )



41. Which one of the following is not a top management function?  
(a) Planning  
(b) Organizing  
(c) Decision making  
(d) **Day to day operations** ( )
42. Which of the following is not a part of MIS?  
(a) Exception report for middle management  
(b) Summary report for top management  
(c) Action report for line management  
(d) **Payroll for workers** ( )
43. One line data entry is most suitable in the case of :  
(a) Entering monthly monthly journal entries  
(b) payroll master updation  
(c) Processing payment of cheque in a bank  
(d) **None of the above** ( )
44. The basic objective of systems analysis is to:  
(a) Understand computer hardware by opening the system unit  
(b) Train managers in mathematical analysis  
(c) Run simulation program  
(d) **Understand a complex system and modify it in some way**  
( )
45. System quality relates to its:  
(a) Reliability (b) Efficiency  
(c) **Maintainability** (d) All of three above ( )
46. The balance sheet of a company reflects:  
(a) Its status at any given point of time  
(b) Its performance during the course of the year  
(c) Neither a nor b  
(d) **both a and b** ( )
47. The starting point for developing of an MIS is:  
(a) Purchase of a minicomputer  
(b) Providing PCs to all manager  
(c) **Identification of the business processes that are the essence of the business**  
(d) None of the above ( )
48. Ideally, the information system objectives, should be stated in the form of:

- (a) Increases product sales (b) Reduced marketing cost  
(c) Increased product x sales by 5% in the next quarter  
(d) **All of the above** ( )
49. Environment in systems parlance refers to:  
(a) A sub system  
(b) The boundary  
(c) **A part outside the boundaries**  
(d) None of the above ( )
50. Which of the following is not a level of information handling:  
(a) **Decision Support System (DSS)**  
(b) Operations Assistance System  
(c) Transaction Processing System (TPS)  
(d) Office Automation system ( )
51. An information system that responds immediately to the needs of the physical system is called in:  
(a) Inline system  
(b) On line system  
(c) **Real time system**  
(d) None of the above ( )
52. The system conversion technique of totally removing the existing system and immediately implementing the new system is called in:  
(a) Cresh Conversion (b) **Phased Conversion**  
(c) Pilot conversion (d) Parallel run ( )
53. Spoken message may be stored and forwarded by:  
(a) **Voice Mail System** (b) video conferencing  
(c) E-mail (d) Expert system ( )
54. In a supermarket, which of the following, will be found in use in its computerized system?  
(a) Scanner  
(b) **bar code reader**  
(c) POS terminal  
(d) All of the above ( )
55. Decision tables link conditions and:  
(a) Tables (b) programs  
(c) **Actions** (d) None of the above ( )
56. In a passenger reservation system, which of the following is the most critical?  
(a) Ease of programming

- (b) **Response time**  
(c) GUI  
(d) None of the above ( )
57. A data dictionary:  
(a) Gives the meaning of the data names used in the system  
(b) Defines the data types  
(c) **Defines all data elements and structures used in DFD**  
(d) None of the above ( )
58. A software design description document only includes:  
(a) Data dictionary (b) ER diagram  
(c) DFD (d) **All of the above** ( )
59. Backup and recovery procedure are necessary to:  
(a) Recognize the disk  
(b) Control the DBA  
(c) **Handle contingencies like files getting corrupts or becoming irretrievable**  
(d) None of the above ( )
60. The sequence of steps following in a system study is:  
(a) Problem definition, Systems Design, Systems Analysis, Programming and Implementing  
(b) System analysis, systems design and system implementation  
(d) **Problem definition, system analysis systems design, programming and implementation**  
( )
61. Most important aspect of system design focus on:  
(a) Economics and technical feasibility  
(b) Operational feasibility  
(c) Developing end user information needs  
(d) **All of the above** ( )
62. The most important reason for failure of MIS is:  
(a) Use of improper tools for design  
(b) **Non involvement of end users**  
(c) Improper specification  
(d) None of the above ( )
63. To implement a MIS:  
(a) A computer is inescapable  
(b) E-mail is required

- (c) **Proper system and procedure must be in place**  
(d) None of the above ( )
64. A parallel run involves :  
(a) Firing two different application from different terminals accessing a common database  
(b) Compiling programs with two different languages  
(c) **The concurrent operation of the existing and newly developed system**  
(d) None of the above ( )
65. Schedule of Delivery' is an example of a :  
(a) Data processing system  
(b) **Transaction based system**  
(c) Decision support system  
(d) None of the above ( )
66. Which of the following is a tactical decision?  
(a) Diversification (b) Workshop location  
(c) Budget allocation (d) **None of the above** ( )
67. Select the most appropriate statement from the following:  
(a) Operational Managers make unstructured decisions  
(b) Middle level managers undertake long range planning  
(c) **As the management level goes up the hierarchy, information becomes more and more summarized**  
(d) None of the above ( )
68. If the requirements analysis phase of a software development project is not done properly then file :  
(a) Resulting system would be delivered before time  
(b) Output reports would be indecipherable  
(c) **System might fail to address the real needs of users**  
(d) All of the above ( )
69. Whether a proposed system can provide right information for the organization personnel, falls under the study of:  
(a) Economic feasibility (b) **Operational Feasibility**  
(c) Technical feasibility (d) All of the above ( )
70. Managers in organization should not design their own systems as:  
(a) System have to interact with other systems  
(b) They do not have the special skills necessary to design systems  
(c) **It is not their job**  
(d) They are always very busy ( )

71. System evaluation is carried out:
- (a) **After the system has been operational for a reasonable time**
  - (b) During system implementation
  - (c) Whenever managers of user organization want it
  - (d) Whenever operational staff want it ( )
72. A cost benefit analysis is performed as apart of:
- (a) System design
  - (b) System specification
  - (c) System performance assessment
  - (d) **Feasibility analysis** ( )
73. The scope of the system test includes:
- (a) Both computerized and manual procedure
  - (b) Only test of computer procedure
  - (c) **Computerized procedure, manual, procedure computer operations and controls**
  - (d) Mainly computerized procedure and operations controls ( )
74. Security in the design of information system is used to:
- (a) Inspect the system and check that it is build as per the specification
  - (b) Protect data from accidental or intentional loss
  - (c) **Ensure that the system processes data as it was designed to and that the results are reliable**
  - (d) Ensure privacy of data processes by it ( )
75. Goals are identified by:
- (a) **Finding the deficiencies in the current system**
  - (b) Observing the current system
  - (c) Analyzing the competitor's system
  - (d) Finding the advantages in the current system ( )
76. When is menu interface a convenient way of user interaction?
- (a) For data processing in a restaurant
  - (b) **When mouse is used as the main input device**
  - (c) When data has to be imported from a spreadsheet
  - (d) When it is difficult for the user to remember all the options available and for typing in complicated commands ( )
77. 'CAM' is used in which industry?
- (a) Automobile
  - (b) Helicopter
  - (c) Three wheeler
  - (d) **All of the above** ( )
78. Prototyping aims at:
- (a) End user understanding and approval



- (b) Program logic  
(c) Planning of data flow originations  
(d) **None of the above** ( )
79. Which of the following is not a tool of data collection ?  
(a) On site observation (b) **Flowcharts**  
(c) Interviews (d) Questionnaires ( )
80. Loss of data integrity implies that data is:  
(a) **Not suitable for running in an integrated environment**  
(b) Inconsistent  
(c) Repeated  
(d) Outdated ( )
81. The word 'MIS' includes:  
(a) Management of Information  
(b) Information of System  
(c) System Management  
(d) **All of the above** ( )
82. Which one of the following is not a characteristic of information:  
(a) **Embedded**  
(b) Timelines  
(c) Relevant  
(d) Action oriented ( )
83. Which one is not a part of System Development Process:  
(a) Testing  
(b) Requirement analysis  
(c) **Total Quality Management**  
(d) Implementation ( )
84. Which one of the following statement is correct:  
(a) The study of MIS is about the use of computers  
(b) More data means more information for managers  
(c) **MIS is made to support the lower management**  
(d) MIS is not a complete substitute for effective management ( )
85. Which level of management needs detailed information the most:  
(a) **Lower Management**  
(b) Middle Management  
(c) Top Management  
(d) They all need it equally ( )

86. Which entity is not related to the definition of system:  
(a) Input  
(b) Output  
(c) Process  
(d) **None of the above** ( )
87. What kind of feasibility is not checked during system development:  
(a) Economic feasibility  
(b) **Market feasibility**  
(c) Technical feasibility  
(d) Operational feasibility ( )
88. In which type of implementation, the new system is introduced at one location or site only for trial:  
(a) Phase  
(b) Parallel  
(c) Plunge (cut off)  
(d) **Pilo**
89. MIS aims to fulfill the organizational needs of:  
(a) Operational staff (b) Top management  
(c) Middle management (d) **All of the above** ( )
90. MIS uses.....to generate important information:  
(a) **Database** (b) Flowcharts  
(c) OS application (d) Networks ( )
91. Which one of the following is not directly do-related:  
(a) Marketing and survey  
(b) **Human resources and CAM**  
(c) Finance and Infrastructure  
(d) DSS and information ( )
92. Which one of the following is not an example of application of MIS in personnel functioning:  
(a) Customer care system (b) Payroll system  
(c) Employee information system  
(d) **Training and development system** ( )
93. What kind of hardware may be used for DB-backup:  
(a) **Tap drive**  
(b) ROM  
(c) RAM

- (d) EEPROM ( )
94. ....are usually set to fulfill short term but time and quantity specific targets:
- (a) Tape derive  
(b) ROM  
(c) **RAM**  
(d) EEPROM ( )
95. What is the key objective of system analysis:
- (a) Understanding working pattern of competitor's work force  
(b) Understanding computer hardware and networking  
(c) **Understanding a system and its complexities for new setup development or modification**  
(d) Train manager in mathematical analysis ( )
96. Decision tables link conditions and:
- (a) Program  
(b) **Actions**  
(c) Data  
(d) Tables ( )
97. Prototyping aims at:
- (a) Program logic  
(b) **End user understanding and approval**  
(c) Planning of data flow organization  
(d) None of the above ( )
98. Absence of 'Data Integrity' means:
- (a) Data is copied more than one time  
(b) Data is not suitable to run in an integrated environment  
(c) Data is time expired  
(d) **Data is not consistent**  
( )
99. Which system encourages employee to give new idea and share his business experience within the organization
- (a) Expert system (b) Office automation system  
(c) **Knowledge management system** (d) Decision support system ( )

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