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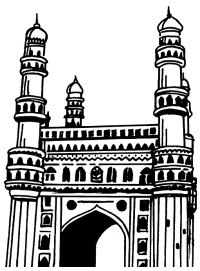

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UNIT I

**INTRODUCTION TO MIS:**

The Technical and Business Perspective, Organization Structure, Evaluation of MIS through Information System, The Decision Making Process , System Approach to Problem Solving, The Structure of Management Information System, MIS Organization within the Company.

## 1.1 INTRODUCTION TO MIS

**Q1. Define MIS. Explain its Concept.**

*Ans :* **(Imp.)**

**Meaning**

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

"'MIS' is a planned system of collecting, storing and disseminating data in the form of information needed to carry out the functions of management."

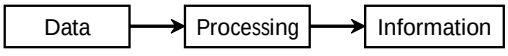
Academically, the term is commonly used to refer to the group of information management methods tied to the automation or support of human decision making, e.g. Decision Support Systems, Expert Systems, and Executive Information Systems.

**(i) 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.

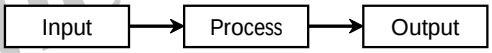
**(ii) Information**

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.




**(iii) 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.




**Definition**

The Management Information System (MIS) is a concept of the last decade or two. It has been understood and described in a number ways. It is also known as the Information System, the Information and Decision System, the Computer-based information System.

The MIS has more than one definition, some of which are give below:

1. The MIS is defined as a system which provides information support for decision making in the organization.
2. The MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision-making function in the organization.
3. The MIS is defined as a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.

4. The MIS is defined as a computer-based Information System.

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

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

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

In order to get a better grip on the activity of information processing, it is necessary to have a formal system which should take care of the following points:

- Handling of a voluminous data.
- Confirmation of the validity of data and transaction.
- Complex processing of data and multidimensional analysis.
- Quick search and retrieval.
- Mass storage.
- Communication of the information system to the user on time.
- Fulfilling the changing needs of the information.

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

**Q2. Explain the characteristics of MIS ?**

*Ans :* **(Imp.)**

**1. Systems Approach**

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

**2. Management Oriented**

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

**3. Need Based**

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

**4. Exception Based**

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

**5. Future Oriented**

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

**6. Integrated**

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

**7. Common Data Flow**

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

**8. Long Term Planning**

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

**9. Sub System Concept**

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

**10. Central database**

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

**Characteristics of Computerized MIS**

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

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

**Q3. Discuss the role of MIS in organization.**

*Ans :*

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

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

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

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

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

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

## Q4. Explain various components and functions of MIS.

*Ans :*

### Components

Management information system refers to the data, hardware and the computer programs that are used to develop information for managerial use.

- **People** - it is the only living component of MIS which operates, controls the other components of MIS.
- **Procedure** – procedure explain people how to operate the computer hardware.
- **Data** – Data provide interface between the user and computer.
- **Hardware** – It is the machine part of the system which executes the instruction in programs.
- **Programs** – The program is the set of instruction written in logical order for performing specific task related to information production.

### Functions

**(i) Data Capturing**

MIS captures data from various internal and external sources of an organisation. Data capturing may be manual or through computer terminals. End users typically record data about transactions on some physical medium, such as a paper form, or enter it directly into a computer system.

**(ii) Processing of Data**

The captured data is processed to convert it into the required management information. Processing of data is done by such activities as calculating, comparing, sorting, classifying and summarising. These activities organise, analyse and manipulate data using various statistical, mathematical, operations research and/or other business models.

**(iii) Storage of Information**

MIS stores processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organisational record. In this activity, data and information are retained in an organised manner for later use. Stored data is commonly organised into fields, records, files and databases.

**(iv) Retrieval of Information**

MIS retrieves information from its stores as and when required by various users. As per the

requirements of management users, the retrieved information is either disseminated as such or it is processed again to meet the exact MI demands.

**(v) Dissemination of Information**

Information, which is a finished product of MIS, is disseminated to the users in the organisation. It could be periodic through reports, or on-line through computer terminals.

**Q5. Explain the nature of MIS ?**

*Ans :* **(Imp.)**

**1. Report Orientation**

The concept of Management Information System is modified, so, that information rather than voluminous data has become the requirement of the user.

**2. Action-Oriented**

This concept was further modified due to the need that information should be such that it leads to some action, decision or investigation or research.

**3. Exception Oriented**

After having action oriented nature of Management Information System it was realized that there must be some specific or selective approach to the action or the analysis of data.

**4. Data-base Orientation**

As we know our environment is dynamic in nature so the change in every system is must. So the concept of Management Information system based on database is emerged and proven to be effective.

**5. End-user Orientation**

After successfully implementing these changes, the concept of end user computing using multiple data bases emerged. This concept brought a basic change in the nature of management information system that is decentralization of system and independency of user over computer professionals or experts.

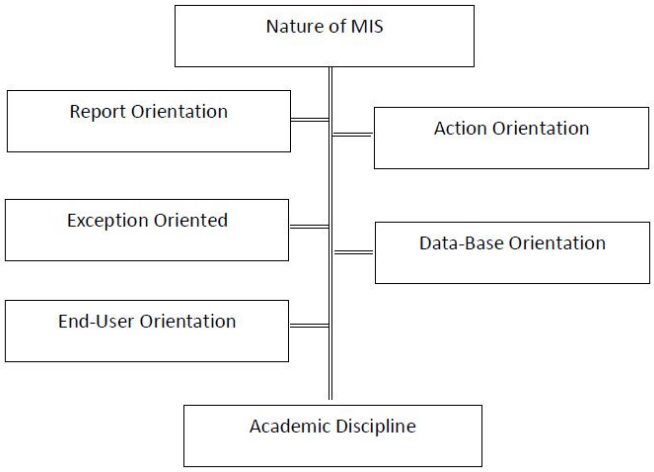



**Fig. : Nature of MIS**

**6. Academic Discipline Orientation**

Management Information System is based on the information gathered for analyzing the data. While analyzing the data it relies on many academic disciplines like theories, Principles, and concepts from management, organization behavior, computer science, psychology and human behavior.

**Q6. Explain the importance of MIS.**

*Ans :*

MIS is important in business because of the following reasons:

1. It helps in minimizing risk in decision-making
2. It processes the data and derives information out of them
3. It provides information about the various aspects of business
4. It helps the executives to avail the information regarding the functional areas quickly
5. It helps the HRD manager in finding out the requirement of the human resource, their wages and salary, performance appraisal, training, promotion, absenteeism and employees, turnover, which is useful in drafting sound HRD policies.

## 1.2 Technical and Business Prospective on Information Systems

**Q7. Discuss the technical and business prospective of MIS?**

*Ans :* **(Imp.)**

**I) Business Perspective**

Managers and business firms invest in information technology and systems because they provide real economic value to the business. The decision to build or maintain an information system assumes that the returns on this investment will be superior to other investments in buildings, machines, or other assets. These superior returns will be expressed as increases in productivity, as increases in revenues (which will increase the firm's stock market value), or perhaps as superior long-term strategic positioning of the firm in certain markets (which produce superior revenues in the future).

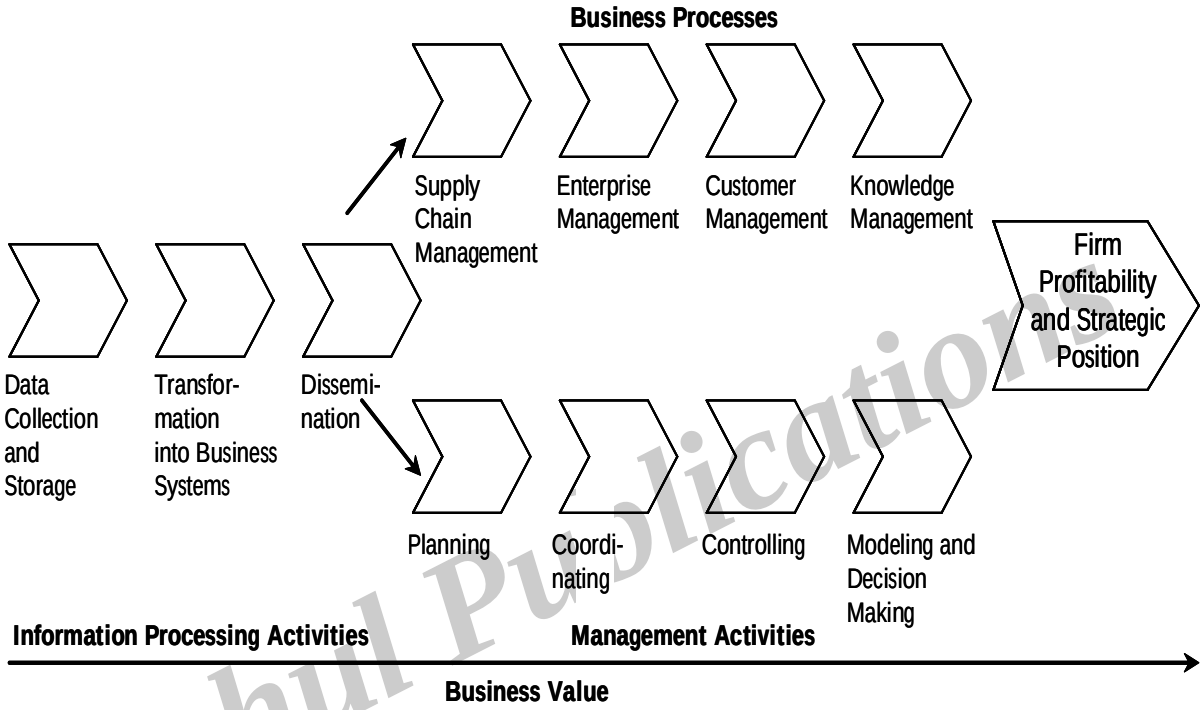
We can see that from a business perspective, an information system is an important instrument for creating value for the firm. Information systems enable the firm to increase its revenue or decrease its costs by providing information that helps managers make better decisions or that improves the execution of business processes.

Every business has an information value chain, illustrated in Figure in which raw information is systematically acquired and then transformed through various stages that add value to that information. The value of an information system to a business, as well as the decision to invest in any new information system, is, in large part, determined by the extent to which the system will lead to better management decisions, more efficient business processes, and high firm profitability. Although there are other reasons why systems are built, their primary purpose is to contribute to corporate value.

From a business perspective, information systems are part of a series of value-adding activities for acquiring, transforming, and distributing information that managers can use to improve decision making,

enhance organizational performance, and, ultimately, increase firm profitability. The business perspective calls attention to the organizational and managerial nature of information systems. An information system represents an organizational and management solution, based on information technology, to a challenge or problem posed by the environment.

The diagram shows how the production firm systems solved the business problem presented by the need to integrate its production and manufacturing processes.






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

These systems provide a solution that takes advantage of new interactive digital technology and opportunities created by a host of technologies such as GPS. The firm developed new ways to coordinate production, manufacturing, and sales. The diagram also illustrates how management, technology, and organizational elements work together to create system solutions.

### II) Technical Perspective

The technical approach to information systems emphasizes mathematically based models to study information systems, as well as the physical technology and formal capabilities of these systems. The disciplines that contribute to the technical approach are computer science, management science, and operations research.

Computer science is concerned with establishing theories of computability, methods of computation, and methods of efficient data storage and access. Management science emphasizes the development of models for decision-making and management practices. Operations research focuses on mathematical techniques for optimizing selected parameters of organizations, such as transportation, inventory control, and transaction costs.

## 1.3 Organization Structure

**Q8. Write about organizational structure of MIS?**

*Ans :*

1. MIS is an integrated system for providing information to support:
   - The operations
   - Management
   - Decision-making functions in an organization
2. MIS utilizes computer hardware/ software, manual procedures, management and decision models and a data base.
3. MIS as a pyramid structure

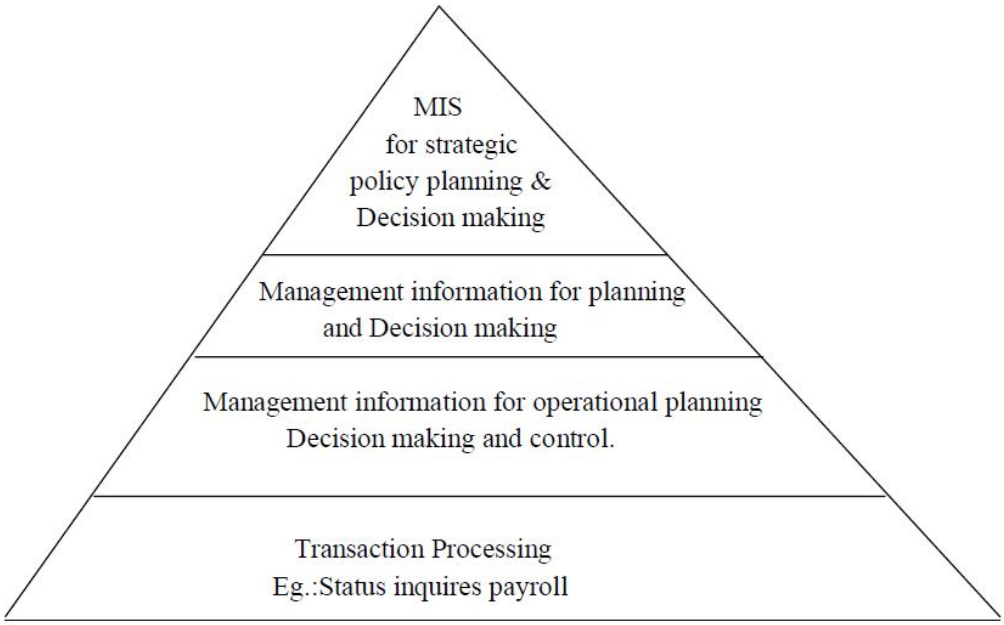



**Fig. : MIS and Planning Decision Making and Control**

The management information system is a pyramidal structure in which the bottom layer consists of information for transaction processing, status enquires, etc., the next level consists of information resources in support of day-to-day operations and control, the third level consists of information system resources to aid in tactical planning and decision making for management control and the top level consists of information resources to support strategic planning and policy making by higher levels of management.

Each level of information processing may make use of data provided for lower levels, but net data may also be introduced.

For example, some of the information to support management and decision making is provided by the data obtained for transaction processing, with some may be new data about activities external to the organization.

## 1.4 Evaluation of MIS through Information Systems

**Q9. What is evaluation of MIS? Explain various approaches of MIS.**

**(OR)**

**Briefly explain various approaches of MIS**

*Ans :* **(Imp.)**

Evaluation of MIS is an integral part of the management control process, in which the organisations determine or appraise the quality or worth of their information systems. In other words, evaluation of MIS is a process of measuring performance of organisational information systems. The feedback so obtained helps determine the necessary adjustments to be made in their information systems.''

**(i) Quality Assurance Review**

Quality assurance reviews or technical reviews focus on assessing the information system's technical quality, e.g. comparison to standards and operations acceptance procedures. Technical evaluation includes variables like data transmission rate, main/secondary storage, CPU capacity, etc. Technical reviews are performed by MIS development/ operations personnel or a separate quality assurance group within the MIS function.

**(ii) Compliance Audits**

Compliance audits or application control reviews assess the adequacy and completeness of controls for the system inputs, outputs, processing, security and access. Compliance audits are typically performed by an autonomous internal audit function.

**(iii) Budget Performance Review**

Evaluation of MIS budget performance concentrates on compliance with a predetermined budget expenditure level for the MIS development or operations process. Evaluation of user budget performance has its focus on MIS resource consumption by the user. Both may be supported by a chargeback mechanism.

**(iv) MIS Personnel Productivity Measurement**

The capability of MIS personnel is typically determined in terms of productivity. Examples of productivity measures include lines of code per unit time for the programming (development) personnel and keystrokes per unit time for the data entry (operations) personnel.

**(v) Computer Performance Evaluation**

The production capability of the computer hardware is typically evaluated in terms of performance efficiencies and bottlenecks that limit production. For example, computer performance evaluation measurements are made on per cent uptime, actual throughput, and I/O channel utilisation.

**(vi) Service Level Monitoring**

Service level monitoring focuses on assessing the information and support provided to the user, based on the terms established between the MIS and the user personnel. Assessment of the information provided include turnaround time, response time and error rates. Assessment of the support provided include the time required to respond to the user's problems and requests for changes.

**(vii) User Attitude Survey**

User attitude survey method is used in operational evaluation. Operational considerations refer to whether the input data is adequately provided and the output is usable. This type of attitude surveys are conducted through questionnaires and/or interviews to appraise the user's perceptions of the information and support given by the MIS function. User attitude surveys typically assess such aspects as the quality and timeliness of reports, quality of service and MIS-user communication.

**(viii) Post-Installation Review**

The focus of a Post-Installation Review (PIR) is often on estimating whether the system meets the requirement definition, the scope of the PIR may include a post- hoc review of the development and operation processes, an examination of the information and support provided, an analysis of the actual use process, and cost/benefit analysis of the system and its effects on the user performance.

**(ix) Cost/Benefit Analysis**

Cost/Benefit analysis is also known as economic evaluation. The analysis quantifies the system's effect on organisational performance in terms of dollars, e.g. direct cost savings or tangible financial benefits. Cost/ Benefit analysis is often used in capital budgeting to gauge the return on investment

**Q10. Explain the importance of evaluation of MIS ?**

*Ans :*

Increasing impact of information processing for organizational decision making.

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

**11. Discuss two major class of performance measurement.**

**(OR)**

**Briefly describe the two classes of evaluation.**

*Ans :*

Evaluation of performance measurement consists of two major classes, as given below.

**(i) Effectiveness**

This refers to the quality of the outputs from the system. Effectiveness means doing the 'right' thing in the right manner so that desired result may be achieved. Information System is said to be effective if its product (i.e. output) is of quality, and the process of producing output is right (effective).

**(ii) Efficiency**

It is a measure of the amount of resources required to achieve the output, i.e. the use of system resources to get results. Being efficient implies the system is operating the 'right' way.

The relationship between effectiveness and efficiency is that effectiveness is a measure of the 'goodness' of output, while efficiency is a measure of the resources required to achieve the output.

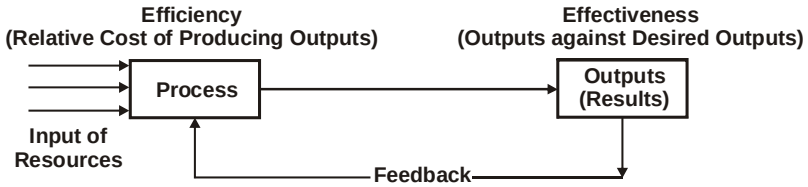



**Fig.: Relationship between Efficiency and Effectiveness**

There are various dimensions of information systems that should be evaluated. These may include the development process, which, concerns whether the system was developed following set standards; information being provided and the system's performance. Depending upon the dimensions of the information system to be evaluated, an appropriate evaluation approach may be adopted.

**Q12. What is product based Evaluation? Explain the model structure of implementing product based evaluation.**

*Ans :* **(Imp.)**

**Product-based MIS Evaluation**

The product-based MIS evaluation is also known as effectiveness evaluation. Determines the effectiveness of an MIS output. For assessing the effectiveness of MIS output, a model structure may be used.

**Model Structure:** A model structure is a structure that contains various information attributes such as timeliness and relevance. To determine the MIS effectiveness in an organization, we need to determine the information attributes for the MIS output.

Some of commonly used attributes are,

- **Timeliness:** Real-time information may be called information that is evaluated in a very short period.
- **Relevance:** Questions such as timeliness, authority or novelty of the outcome may include significance.
- **Accuracy:** The accuracy of information or measurements is their consistency, even in small details, of being accurate or correct.
- **Completeness:** Completeness' refers to how comprehensive the data is.
- **Adequacy:** The ability to obtain the information required for decision making in a timely and reliable manner.
- **Explicitness:** The degree to which the MIS is consistent with the particular organization.
- **Exception-based:** MIS should be built based on the exception-based reporting concept, which implies an irregular condition where the maximum, minimum, or predicted values differ outside the limits. Exception reporting should be given to the decision-maker at the appropriate level in such cases.

**Q13. Explain briefly about cost benefit analysis.**

*Ans :*

Cost benefit analysis is considered as a best method of estimating the financial impact of developing an information system, which is a kind of business investment similar to new warehouse development process. This analysis is performed in order to determine whether alternative design options are economically feasible or not. It is very' much essential to compare the benefits of information system against the benefits of capital budgeting projects.

**Benefits of information Systems**

The benefits of information system is measured based on the financial, economical impact the project has on the organization. The following are the different benefits of information system,

(a) Tangible benefits

(b) Intangible benefits.

**(a) Tangible Benefits**

Tangible benefits are the benefits that are measured in terms of money or profit i.e., they are quantitative.

**Examples**

- Increased revenue
- Decreased costs
- Reduce processing errors
- Faster turnaround
- Reduced inventory cost
- Reduced administrative expenses
- Reduced cost of paperwork processing.

**(b) Intangible Benefits**

Intangible benefits are another important type of benefits that cannot be measured in terms of money i.e., they are not quantitative.

**Examples**

- Better customer service
- Improved employee's moral values
- Better decision making
- Increased customer goodwill
- Improved job satisfaction.

**Costs of Information System**

The cost associated with the development of information system needs to be estimated both by users as well as system analyst. Though cost may overweight the benefit factor, the latter is very important when compared to former as the selection of project is done mostly based on benefit factor i.e., if cost is more than benefit, then it is not feasible to develop such projects. Some of the different types of costs are as follows,

(a) Initial development costs

(b) Capital costs

(c) Annual costs.

**(a) Initial Development Costs**

These are nonrecurring (i.e., onetime) costs that are incurred while performing

- System analysis
- System design
- Coding, testing and debugging
- Training and conversion
- Inspections and walkthrough
- Documentation.

**(b) Capital Costs**

Capital costs are nonrecurring (i.e., one time) costs. These costs are incurred while,

- Purchasing new equipments, software package
- Performing file conversion
- Installing the equipments

In addition to these costs, there is a possibility that some extra costs may be incurred while using a new software, purchasing new peripheral devices.

**(c) Annual Costs**

Operations and maintenance are recurring costs that are initiated as soon as the system installation is completed. These costs include usage cost, overhead cost (power, insurance), supply cost, personnel cost (salaries), programmer's maintenance cost. In addition, an extra ongoing cost is incurred while performing personnel training.

## 1.5 The Decision Making Process

**Q14. Define decision making. Explain the process of decision making?**

*Ans :* **(Imp.)**

**Meaning**

Decision-making is a cognitive process that results in the selection of a course of action among several alternative scenarios.

Decision-making is a daily activity for any human being. There is no exception about that. When it comes to business organizations, decision-making is a habit and a process as well.

Effective and successful decisions result in profits, while unsuccessful ones cause losses. Therefore, corporate decision-making is the most critical process in any organization.

In a decision-making process, we choose one course of action from a few possible alternatives. In the process of decision-making, we may use many tools, techniques, and perceptions.

In addition, we may make our own private decisions or may prefer a collective decision.

Usually, decision-making is hard. Majority of corporate decisions involve some level of dissatisfaction or conflict with another party.

**Process**

Following are the important steps of the decision-making process. Each step may be supported by different tools and techniques.

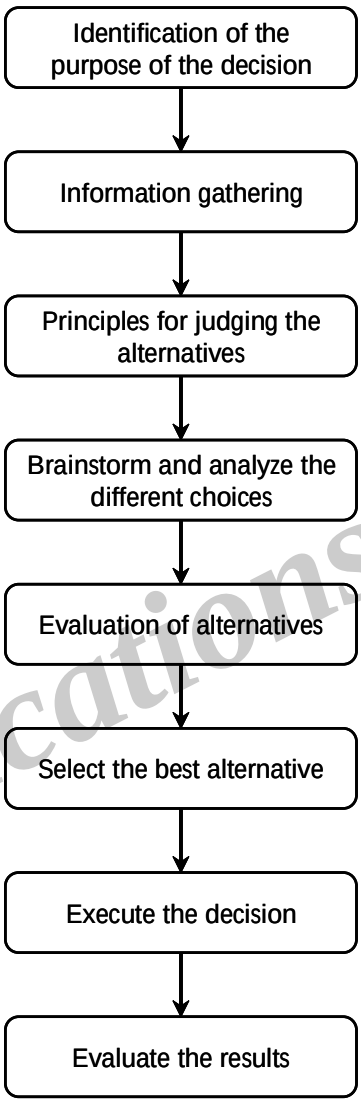



**Fig. : Process of Decision Making**

**Step 1: Identification of the Purpose of the Decision**

In this step, the problem is thoroughly analyzed. There are a couple of questions one should ask when it comes to identifying the purpose of the decision.

- What exactly is the problem?
- Why the problem should be solved?
- Who are the affected parties of the problem?
- Does the problem have a deadline or a specific time-line?

**Step 2: Information Gathering**

A problem of an organization will have many stakeholders. In addition, there can be dozens of factors involved and affected by the problem.

In the process of solving the problem, you will have to gather as much as information related to the factors and stakeholders involved in the problem. For the process of information gathering, tools such as 'Check Sheets' can be effectively used.

**Step 3: Principles for Judging the Alternatives**

In this step, the baseline criteria for judging the alternatives should be set up. When it comes to defining the criteria, organizational goals as well as the corporate culture should be taken into consideration.

As an example, profit is one of the main concerns in every decision making process. Companies usually do not make decisions that reduce profits, unless it is an exceptional case. Likewise, baseline principles should be identified related to the problem in hand.

**Step 4: Brainstorm and Analyze the Choices**

For this step, brainstorming to list down all the ideas is the best option. Before the idea generation step, it is vital to understand the causes of the problem and prioritization of causes.

For this, you can make use of Cause-and-Effect diagrams and Pareto Chart tool. Cause-and-Effect diagram helps you to identify all possible causes of the problem and Pareto chart helps you to prioritize and identify the causes with the highest effect.

Then, you can move on generating all possible solutions (alternatives) for the problem in hand.

**Step 5: Evaluation of Alternatives**

Use your judgment principles and decision-making criteria to evaluate each alternative. In this step, experience and effectiveness of the judgment principles come into play. You need to compare each alternative for their positives and negatives.

**Step 6: Select the Best Alternative**

Once you go through from Step 1 to Step 5, this step is easy. In addition, the selection of the best alternative is an informed decision since you have already followed a methodology to derive and select the best alternative.

**Step 7: Execute the decision**

Convert your decision into a plan or a sequence of activities. Execute your plan by yourself or with the help of subordinates.

**Step 8: Evaluate the Results**

Evaluate the outcome of your decision. See whether there is anything you should learn and then correct in future decision making. This is one of the best practices that will improve your decision-making skills.

**Q15. Explain various techniques used in decision making.**

*Ans :*

The following are some of the techniques often used in decision-making.

- **Simulation :** In this approach, a mathematical model of the situation is created. Main decision variables are defined and the model is operated under different assumptions or with different starting condition to help explore alternative paths for the real situation.
- **Optimization :** In Optimization technique a mathematical model of the situation is developed.
- **OLAP and Data mining :** It uses statistical techniques to analyze the business results and find hidden relationship
- **Expert System:** Here an expert's view of an area of knowledge in terms of facts and rules are summarized and then the facts and rules to a particular situation are applied to help someone else decide what to do.

- **Neural Networks:** It starts with a large set of coded examples that represent the range and frequency of possibilities in the situation being studied.
- **Fuzzy Logic:** In this approach, decision processes are controlled using logic systems that replace 'either' or 'logic' with logic based on relative degree of inclusion in sets.
- **Case based reasoning:** This approach creates a database of examples that may help in making decision.
- **Intelligent Agents:** In this technique, decision parameters are specified for a computerized 'agent' that searches one or more database to find a specific answer, such as the lowest price for a particular mobile set.

## 1.6 Systems Approach to Problem Solving

**Q16. Explain the concept of systems approach to problem solving.**

*Ans :* **(Imp.)**

The systems approach to problem solving used a systems orientation to define problems and opportunities and develop solutions. Studying a problem and formulating a solution involve the following interrelated activities:

### 1. Defining Problems and Opportunities

Problems and opportunities are identified in the first step of the systems approach. A problem can be defined as a basic condition that is causing undesirable results. An opportunity is a basic condition that presents the potential for desirable results. Symptoms must be separated from problems. Symptoms are merely signals of an underlying cause or problem.

**Example:** Symptom: Sales of a company's products are declining. Problem: Sales persons are losing orders because they cannot get current information on product prices and availability. Opportunity: We could increase sales significantly if sales persons could receive instant responses to requests for price quotations and product availability.

### 2. Systems Thinking

Systems thinking is to try to find systems, subsystems, and components of systems in any situation your are studying. This viewpoint ensures that important factors and their interrelationships are considered. This is also known as using a systems context, or having a systemic view of a situation. I example, the business organization or business process in which a problem or opportunity arises could be viewed as a system of input, processing, output, feedback, and control components. Then to understand a problem and save it, you would determine if these basic system functions are being properly performed.

**Example:** The sales function of a business can be viewed as a system. You could then ask: Is poor sales performance (output) caused by inadequate selling effort (input), out-of-date sales procedures (processing), incorrect sales information (feedback), or inadequate sales management (control)? Figure illustrates this concept.

### 3. Developing Alternate Solutions

There are usually several different ways to solve any problem or pursue any opportunity. Jumping immediately from problem definition to a single solution is not a good idea. It limits your options and robs you of the chance to consider the advantages and disadvantages of several alternatives. You also lose the chance to combine the best points of several alternative solutions.

Where do alternative solutions come from/ experience is good source. The solutions that have worked, or at least been considered in the past, should be considered again. Another good source of solutions is the advice of others, including the recommendations of consultants and the suggestions of expert

systems. You should also use your intuition and ingenuity to come up with a number of creative solutions. These could include what you think is an ideal solution. The, more realistic alternatives that recognize the limited financial, personnel, and other resources of most organizations could be developed. Also, decision support software packages can be used to develop and manipulate financial, marketing, and other business operations. This simulation process can help you generate a variety of alternative solutions. Finally, don't forget that "doing nothing" about a problem or opportunity is a legitimate solution, with its own advantages and disadvantages.

### 4. Evaluating Alternate Solutions

Once alternative solutions have been developed, they must be evaluated so that the best solution can be identified. The goal of evaluation is to determine how well each alternative solution meets your business and personal requirements. These requirements are key characteristics and capabilities that you feed are necessary for your personal or business success.

**Example:** If you were the sales manager of a company, you might develop very specific requirements for solving the sales-related information problems of your salespeople. You would probably insist that any computer-based solution for your sales force be very reliable and easy to use. You might also require that any proposed solution have low start-up costs, or have minimal operating costs compared to present sales processing methods.

Then you would develop evaluation criteria and determine how well each alternative solution meets these criteria. The criteria you develop will reflect how you previously defined business and personal requirements. For example, you will probably develop criteria for such factors as start-up costs, operating costs, ease of use, and reliability. Criteria may be ranked or weighted, based on their importance in meeting your requirements.

### 5. Selecting the Best Solution

Once all alternative solutions have been evaluated, you can being the process of selecting the best solution. Alternative solutions can be compared to each other because they have been evaluated using the same criteria.

**Example:** Alternatives with a low accuracy evaluation (an accuracy score less than 10), or a low overall evaluation (an overall score less than 70) should be rejected. Therefore, alternative B for sales data entry is rejected, and alternative A, the use of laptop computers by sales reps, is selected.

### 6. Designing and Implementing Solution

Once a solution has been selected, it must be designed and implemented. You may have to depend on other business end users technical staff to help you develop design specifications and an implementation plan. Typically, design specifications might describe the detailed characteristics and capabilities of the people, hardware, software, and data resources and information system activities needed by a new system. An implementation plan specifies the resources, activities, and timing needed for proper implementation. For example, the following items might be included in the design specifications and implementation plan for a computer-based sales support system:

- Types and sources of computer hardware, and software to be acquired for the sales reps.
- Operating procedures for the new sales support system.
- Training of sales reps and other personnel.
- Conversion procedures and timetable for final implementation.

**7. Post Implementation Review**

The final step of the systems approach recognizes that an implemented solution can fail to solve the problem for which it was developed. The real world has a way of confounding even the most well-designed solutions. Therefore, the results of implementing a solution should be monitored and evaluated. This is called a postimplant-implemented. The focus of this step is to determine if the implemented solution has indeed helped the firm and selected subsystems meet their system objectives. If not, the systems approach assumes you will cycle back to a previous step and make another attempt to find a workable solution.

## 1.7 The Structure of Management Information System

**Q17. Discuss in detail about structure of MIS.**

*Ans :* **(Imp.)**

Structure of MIS is a difficult concept to understand because there is no standard or universally accepted framework for describing management information system. MIS structure may be described by following a variety of different approaches, such as:

1. Physical Components
2. Information system processing functions
3. Decision support
4. Levels of management activities and
5. Organizational functions

**1. Physical Components**

Structure of MIS may be understood by looking at the physical components of the information system in an organization.

(a) Hardware

(b) Software

(c) Database

(d) Procedures

(e) Operating personnel

(f) Input and Output

**2. Information System Processing Functions**

Information system structure can also be understood in terms of its processing functions. The functions of an MIS explain what the system does. The main processing functions of information systems are described below.

**3. To process transactions**

Information systems process transactions. Where transaction may be defined as an activity taking place in an organization.

**4. To maintain master file**

Information systems create and maintain master files in an organization. A master file stores relatively permanent or historical data about organizational entities.

**5. To produce report**

Reports are significant products of an information system. Many reports are produced on a regular basis, which are called scheduled reports. An information system also produces reports on adhoc (special) requests.

**6. To process enquires**

An information system is used to process enquiries. For processing such queries, the information system uses its database. These may be regular enquiries with a pre defined format or adhoc enquiries.

**7. To process interactive support application**

The information system contains applications designed to support systems for planning, analysis and decision-making.

The structure of an information system can also be described in terms of the organizational functions which use information. There is no standard

classification of functions, but a typical set of functions in a manufacturing organization includes Production, sales & marketing, finance and accounting, logistics, personnel, and information system. Top management is also consider as a separate management

The conceptual structure of MIS is defined as a federation of functional subsystems each of which is divide in to four major information processing components like Transaction processing, Operational control information system, Management control information and Strategic planning.

## 1.8 MIS Organization with in the Company

**Q18. Explain the organization function of MIS in the company.**

*Ans :* **(Imp.)**

**Organizational Functions**

**1. Sales and Marketing Subsystem**

The sales and Marketing includes al activities related to the promotion and sales of products or services.

- The Transactions are sales order, promotion orders, etc.
- The Operational control activities include the hiring and training of the sales force, the day-day scheduling of sales and promotion efforts etc.
- Management control concerns comparisons of overall performance against a marketing plan. Information for management control may include data on customers, competitors, competitors products and sales force requirement.
- Strategic Planning for the marketing function involves consideration of new markets and new marketing strategies.

**2. Production Subsystem**

The production functions includes product engineering, planning of production facilities, scheduling and operation of production facilities, employment and training of production personnel and quality control and inspection.

- The typical transaction to be processed is production orders, assembly order, finished parts tickets, scarp tickets and time keeping tickets.
- Operational control requires detailed reports comparing actual performance to the production schedule and highlighting areas.
- Management control requires summary reports comparing overall planned performance to actual performance
- Strategic planning for manufacturing approaches and alternatives approach to automation.

**3. Logistics Subsystem**

The logistics function encompasses such activities as purchasing, receiving, inventory control and distribution.

- The transaction to be processed includes purchase requisition, purchase order, manufacturing orders.
- The Operational control function uses information contained in reports such as past due purchase, past due shipments to customers etc.
- Managerial control information for logistics consists of overall comparisons between planned and actual inventory levels.
- Strategic control involves the analysis of new distribution strategies, new policies with required to vendors.

**4. Personnel subsystem**

Includes hiring, training, record keeping, payment and termination of personnel.

- The transaction result in documents describing employment requisition, job descriptions, training, personal data.
- Operational control for personnel requires decision procedures for action such as hiring, training, termination, changing pay rates, and issuing benefits.
- Management control of the personnel function decision is supported by reports and analysis showing the variances between actual and planned performance.
- Strategic planning fro personnel is involved with evaluating alternatives for recruiting, salary, training, benefits and building location to ensure that the organization obtained and retains personnel.

**5. Finance & Accounting Subsystem**

Finance function covers granting of credit to customer, collection process, cash management and financing arrangements. Accounting covers the classification of financial transaction and summarization in to the standard financial reports, preparation of budgets.

- Transaction associated with finance and accounting are credit applications, sales, billing, collection documents, payment vouchers etc.
- Operational control over the function itself require daily error and exception report, records of processing delays etc.
- Managerial control level for accounting and finance utilizes information on budgeted versus actual cost of financial resources and error rates.
- Strategic planning level for accounting finance involves a long run strategy to ensure adequate financing, a long range tax accounting policy to minimize the impact of taxes.

**6. Information Processing Subsystem**

The information processing function is responsible for ensuring that the other functions are provided the necessary information processing services and resources.

- Typical transaction for information processing service and resources, requests for corrections or changes in data and programs, reports of hardware and program performance and projects proposals.
- Operational control of information processing operations requires information on the daily schedule of jobs, error rates and equipment failures, for new projects development it requires daily or weekly schedules.
- Managerial control over information processing requires data on planned versus actual utilization, equipment cost, overall programmer performance and progress.
- Strategic planning for information system involves the organization of the function, the overall information system plan, selection of strategic uses of information and the general structure of the hardware and software environment.

# Short Question and Answers

**1. Define MIS.**

*Ans :*

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

"'MIS' is a planned system of collecting, storing and disseminating data in the form of information needed to carry out the functions of management."

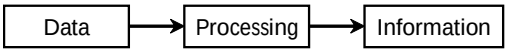
Academically, the term is commonly used to refer to the group of information management methods tied to the automation or support of human decision making, e.g. Decision Support Systems, Expert Systems, and Executive Information Systems.

**(i) 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.

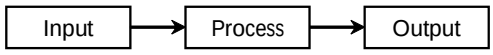
**(ii) Information**

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.




**(iii) 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.




**2. Characteristics of MIS ?**

*Ans :*

**1. Systems Approach**

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

**2. Management Oriented**

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

**3. Need Based**

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

**4. Exception Based**

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

**5. Future Oriented**

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

**6. Integrated**

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

**3. Components of MIS**

Management information system refers to the data, hardware and the computer programs that are used to develop information for managerial use.

- **People** - it is the only living component of MIS which operates, controls the other components of MIS.
- **Procedure** – procedure explain people how to operate the computer hardware.
- **Data** – Data provide interface between the user and computer.
- **Hardware** – It is the machine part of the system which executes the instruction in programs.
- **Programs** – The program is the set of instruction written in logical order for performing specific task related to information production.

**4. Importance of MIS.**

*Ans :*

MIS is important in business because of the following reasons:

1. It helps in minimizing risk in decision-making
2. It processes the data and derives information out of them
3. It provides information about the various aspects of business
4. It helps the executives to avail the information regarding the functional areas quickly
5. It helps the HRD manager in finding out the requirement of the human resource, their wages and salary, performance appraisal, training, promotion, absenteeism and employees, turnover, which is useful in drafting sound HRD policies.

**5. Explain the importance of evaluation of MIS ?**

*Ans :*

Increasing impact of information processing for organizational decision making.

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

**6. Define decision making.**

*Ans :*

Decision-making is a cognitive process that results in the selection of a course of action among several alternative scenarios.

Decision-making is a daily activity for any human being. There is no exception about that. When it comes to business organizations, decision-making is a habit and a process as well.

Effective and successful decisions result in profits, while unsuccessful ones cause losses. Therefore, corporate decision-making is the most critical process in any organization.

In a decision-making process, we choose one course of action from a few possible alternatives. In the process of decision-making, we may use many tools, techniques, and perceptions.

**7. Nature of MIS**

*Ans :*

**1. Report Orientation**

The concept of Management Information System is modified, so, that information rather than voluminous data has become the requirement of the user.

**2. Action-Oriented**

This concept was further modified due to the need that information should be such that it leads to some action, decision or investigation or research.

**3. Exception Oriented**

After having action oriented nature of Management Information System it was realized that there must be some specific or selective approach to the action or the analysis of data.

**4. Data-base Orientation**

As we know our environment is dynamic in nature so the change in every system is must. So the concept of Management Information system based on bata-base is emerged and proven to be effective.

**8. Business Perspective of MIS**

*Ans :*

Managers and business firms invest in information technology and systems because they provide real economic value to the business. The decision to build or maintain an information system assumes that the returns on this investment will be superior to other investments in buildings, machines, or other assets. These superior returns will be expressed as increases in productivity, as increases in revenues (which will increase the firm's stock market value), or perhaps as superior long-term strategic positioning of the firm in certain markets (which produce superior revenues in the future).

We can see that from a business perspective, an information system is an important instrument for creating value for the firm. Information systems enable the firm to increase its revenue or decrease its costs by providing information that helps managers make better decisions or that improves the execution of business processes.

Every business has an information value chain, illustrated in Figure in which raw information is systematically acquired and then transformed through various stages that add value to that information. The value of an information system to a business, as well as the decision to invest in any new information system, is, in large part, determined by the extent to which the system will lead to better management decisions, more efficient business processes, and high firm profitability. Although there are other reasons why systems are built, their primary purpose is to contribute to corporate value.

From a business perspective, information systems are part of a series of value-adding activities for acquiring, transforming, and distributing information that managers can use to improve decision making, enhance organizational performance, and, ultimately, increase firm profitability. The business perspective calls attention to the organizational and managerial nature of information systems. An information system represents an organizational and management solution, based on information technology, to a challenge or problem posed by the environment.

**9. Discuss two major class of performance measurement.**

*Ans :*

Evaluation of performance measurement consists of two major classes, as given below.

**(i) Effectiveness**

This refers to the quality of the outputs from the system. Effectiveness means doing the 'right' thing in the right manner so that desired result may be achieved. Information System is said to be effective if its product (i.e. output) is of quality, and the process of producing output is right (effective).

**(ii) Efficiency**

It is a measure of the amount of resources required to achieve the output, i.e. the use of system resources to get results. Being efficient implies the system is operating the 'right' way.

The relationship between effectiveness and efficiency is that effectiveness is a measure of the 'goodness' of output, while efficiency is a measure of the resources required to achieve the output.

**10. Explain the model structure of implementing product based evaluation.**

*Ans :*

A model structure is a structure that contains various information attributes such as timeliness and relevance. To determine the MIS effectiveness in an organization, we need to determine the information attributes for the MIS output.

Some of commonly used attributes are,

- **Timeliness:** Real-time information may be called information that is evaluated in a very short period.
- **Relevance:** Questions such as timeliness, authority or novelty of the outcome may include significance.
- **Accuracy:** The accuracy of information or measurements is their consistency, even in small details, of being accurate or correct.
- **Completeness:** Completeness' refers to how comprehensive the data is.
- **Adequacy:** The ability to obtain the information required for decision making in a timely and reliable manner.
- **Explicitness:** The degree to which the MIS is consistent with the particular organization.
- **Exception-based:** MIS should be built based on the exception-based reporting concept, which implies an irregular condition where the maximum, minimum, or predicted values differ outside the limits. Exception reporting should be given to the decision-maker at the appropriate level in such cases.

**11. Compare and Contrast data and information.**

*Ans :*

| Data | Information |
|---|---|
| Data is unorganized raw facts that need processing without which it is seemingly random and useless to humans | Information is a processed, organized data presented in a given context and is useful to humans. |
| Data is an individual unit that contains raw material which does not carry any specific meaning. | Information is a group of data that collectively carry a logical meaning. |
| Data doesn't depend on information. | Information depends on data. |
| It is measured in bits and bytes. | Information is measured in meaningful units like time, quantity, etc. |
| Data is never suited to the specific needs of a designer. | Information is specific to the expectations and requirements because all the irrelevant facts and figures are removed, during the transformation process. |
| An example of data is a student's test score | The average score of a class is the information derived from the given data. |

**12. Benefits of information Systems**

*Ans :*

The benefits of information system is measured based on the financial, economical impact the project has on the organization. The following are the different benefits of information system,

**(a) Tangible Benefits**

Tangible benefits are the benefits that are measured in terms of money or profit i.e., they are quantitative.

**Examples**

- Increased revenue
- Decreased costs
- Reduce processing errors
- Faster turnaround
- Reduced inventory cost
- Reduced administrative expenses
- Reduced cost of paperwork processing.

**(b) Intangible Benefits**

Intangible benefits are another important type of benefits that cannot be measured in terms of money i.e., they are not quantitative.

**Examples**

- Better customer service
- Improved employee's moral values
- Better decision making
- Increased customer goodwill
- Improved job satisfaction.

# Choose the Correct Answers

1. Information systems that monitor the elementary activities and transactions of the organizations are _____. [ b ]

   (a) Management level system (b) Operational level system

   (c) Knowledge level system (d) Strategic level system

2. Projections and responses to queries are Information output characteristics associated with _____. [ c ]

   (a) Decision Support System (DSS) (b) Management Information System (MIS)

   (c) Executive Support System (ESS) (d) Transaction Processing System (TPS)

3. Summary transaction data, high-volume data, and simple models information inputs characteristic of _____. [ b ]

   (a) Decision Support System (DSS) (b) Management Information System (MIS)

   (c) Executive Support System (ESS) (d) Transaction Processing System (TPS)

4. Which of the following individuals typically have less formal, advanced educational degrees and tend to process rather than create information? [ d ]

   (a) Knowledge workers (b) Executives

   (c) System analysts (d) Data workers

5. Prototype is a _____. [ a ]

   (a) Working model of existing system (b) Mini model of existing system

   (c) Mini model of processed system (d) None of the above

6. _____ system can be any organized combination of people, hardware, software, communications networks and data resources that collects, transforms and disseminates information in an organization. [ a ]

   (a) Information (b) Integrated

   (c) Horizontal (d) Vertical

7. System development is a _____. [ c ]

   (a) Process of successive changes of system from new and changed requirement

   (b) It is a development of SRS of a system

   (c) Both (a) and (b)

   (d) None of the above

8. The most creative and challenging phase of system life cycle is _____. [ c ]

   (a) Feasibility study (b) Maintenance

   (c) Design (d) None of the above

9. The advantages of creating a prototype are _____. [ c ]

(a) It allows developers to experiment with number of different design options

(b) It can serve as means of communication between developers and customers

(c) Both (a) and (b)

(d) None of the above

10. _____ is the real world object, such as a person, place etc. [ b ]

(a) Attribute (b) Entity

(c) Records (d) All of these

# Fill in the blanks

1. The _____ can be described as a set of elements joined together for a common objective.
2. A _____ is a part of a larger system with which one is concerned.
3. _____is a computer-based system that provides flexible and speedy access to accurate data.
4. The captured data is processed into _____ needed for planning, organizing, coordinating, directing and controlling functionalities at strategic, tactical and operational level.
5. _____ is term used to describe the series of actions taken to provide useful information from data.
6. The _____ is an interface and set of programs that make use of this connectivity as easy as a Windows screen.
7. Transactions involved in _____ subsystem are processing of credit applications, sales, billing, collection payment vouchers, cheques, journal vouchers, ledgers, stock transfers and so on.
8. _____ subsystem is concerned with employment requisitions, job description, training specification, personnel data, pay rate changes, hours worked, benefits, termination notices, etc.
9. Transactions in _____ subsystem are sales orders, promotion orders etc.
10. _____ is not one time activity.



## ANSWESRS

1. System
2. Subsystem
3. MIS
4. Information
5. Data processing
6. World Wide Web (WWW)
7. Finance
8. Personnel
9. Marketing
10. Decision making.

# One Mark Answers

**1. Expand MIS.**

*Ans :*

Management Information Systems

**2. Information**

*Ans :*

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.

**3. Product-based MIS Evaluation**

*Ans :*

The product-based MIS evaluation is also known as effectiveness evaluation.

**4. Cost / Benefit Analysis**

*Ans :*

Cost/Benefit analysis is also known as economic evaluation. The analysis quantifies the system's effect on organisational performance in terms of dollars, e.g. direct cost savings or tangible financial benefits.

**5. Decision Making**

*Ans :*

Decision-making is a cognitive process that results in the selection of a course of action among several alternative scenarios.

**6. Brainstorm**

*Ans :*

Brainstorming to list down all the ideas is the best option.

UNIT II

**INFORMATION SYSTEMS FOR DECISION MAKING:**

Evolution of an Information System, Basic Information Systems, Decision Making and MIS, Decision Assisting Information System, Concepts of Balanced MIS Effectiveness and Efficiency Criteria.

## 2.1 Evolution of Information System

**Q1. Explain the evolution of IS in detail ?**

**(OR)**

**Elucidate the evolution of an information system.**

*Ans :* **(Imp.)**

Information systems (IS) and information technology (IT) are two closely related fields of study that people find very confusing to differentiate between. However, IS is rather large field of study that refers to systems that are designed to create, modify, store and distribute information. IT can be considered as a subset of IS. It deals with the technology part of the IS, and as such deals with hardware, servers, operating systems (OS) and software. IS is in essence bridging the gap between business and the ever growing field of computers and on the other hand, IT is all about managing technology and making use of it for the betterment of business.

**1. Input-processing-output (IPO) model.**

IS consists of three main components as shown in Figure. In addition, IS provides for feedback from output to input.

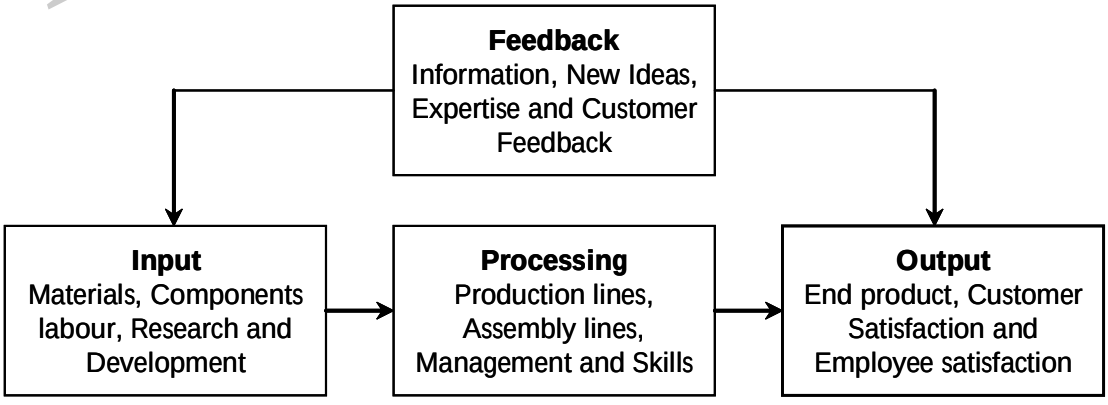



**Fig. : IPO Model**

**(i) Input -** Captures raw data from organization or external environment e.g. Manual or automatic data capturing via scanner, camera, keyboard

**(ii) Processing -** Converts raw data into meaningful form, the output e.g. Sorting, searching, comparisons of data

**(iii) Output -** Transfers processed information to people of activities that use it e.g. Sales report, documentation

**(iv) Feedback -** Output or data that is used to make changes to the input or processing activities

A simple scenario to simulate this model is in a banking environment for ATM transactions where a batch processing system capturing daily ATM transactions, sorting the data and produces a report such as number of withdrawal transactions report.

## 2. History and the Evolution of IS

The growth of the IS field has made significant progress over the past 50 years. As the field has grown, new specialties and research communities have emerged, and the level of research has increased dramatically. It is all taken up with "punch card", electronic calculator and today, it has evolved to e-business, e-commercialism and the latest innovation, mobile computing as well as cloud computing. There is no fixed category or "type" of Information Systems. In Figure, the types of IS are simply a concept, an abstraction, which has been created as a way to simplify a complex problem through identifying areas of commonality between different things.



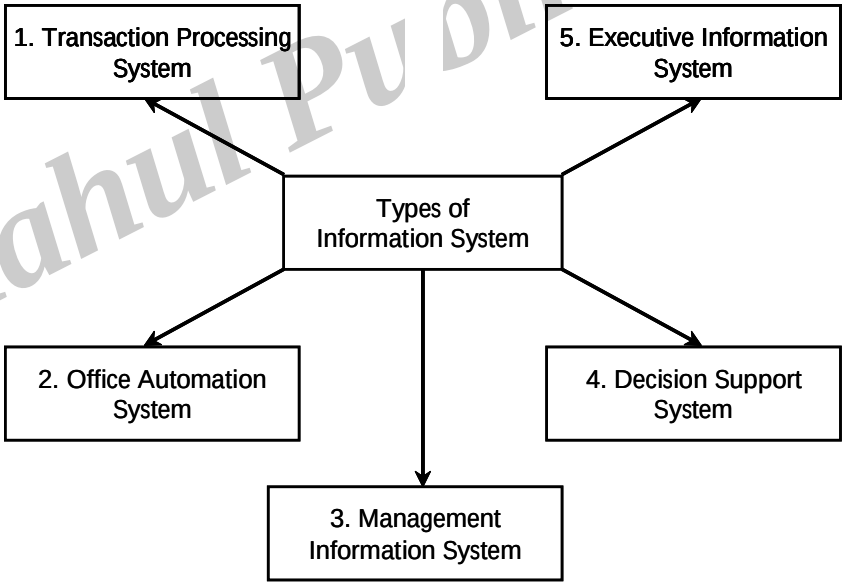



**Fig. : Types of Information System**

As most organizations are hierarchical, the way in which the different classes or type of IS is categorized tends to follow hierarchy. This is often described as "the pyramid model" because the way in which the systems are arranged mirrors the nature of the tasks found at various different levels in the organization. The most usual types of Information Systems among other used in an organization is the four stage model based on the people who use the systems as pictured in Figure.

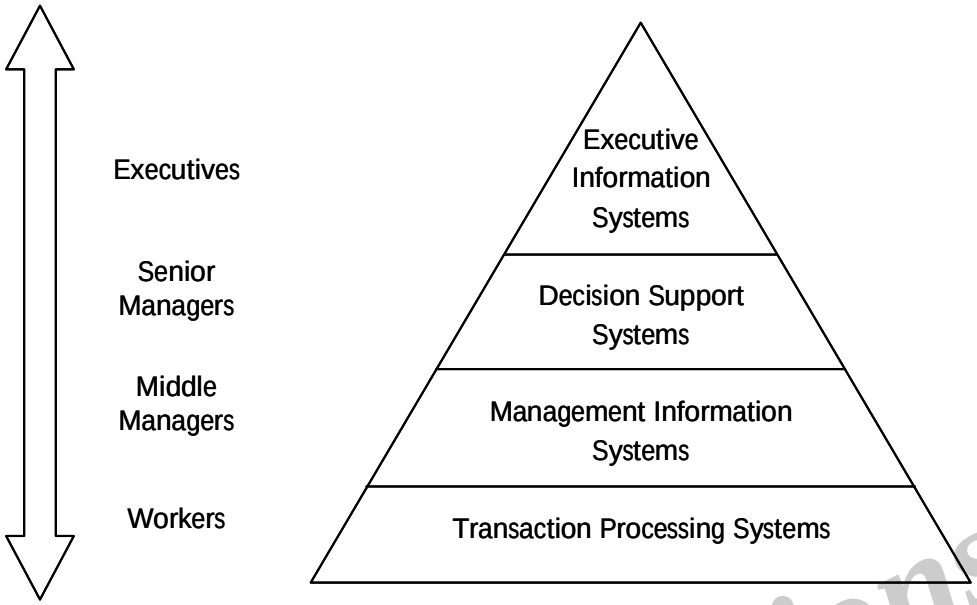



**Fig. : Four Level Pyramid Model of the different Level of Hierarchy**

Using the four level pyramid model above, the history, the difference and how IS has evolved will be further explained in the subsequent sections.

### (i) 1950s - EDP, Transaction Processing System

During this period, the role of most IS was quite simple as they were mainly used for electronic data processing (EDP). It performs activities like transaction processing, recordkeeping and accounting. EDP is often defined as the use of computers in recording, classifying, manipulating, and summarizing data. It is also called transaction processing systems (TPS), automatic data processing, or information processing. (Computer Business Research. "TPS").

**Transaction processing systems -** is a type of information that collects, stores, modifies and retrieve the data transactions of an organization's day-to-day transactions. Examples of outputs from TPS are cash deposits, payment, order, accounting systems and automatic teller machine (ATM).

Clerical staff typically performs the activities associated with TPS, for example, recording a business activity such as client's payment, customer's order and so on. TPS is the first computerized systems developed to process business data - a function originally called data processing.

TPS were among the first computerized systems developed to process business data which function is originally called data processing. Usually TPS computerizes or automates an existing manual process to allow for faster processing, reduced clerical costs and improved customer service.

The early TPS used batch processing data which is accumulated over a period of time and all transactions are processed afterwards. Today, as computer became more powerful, systems developers have built an online transaction processing system (OLTP). However, some routine processing tasks such as calculating paychecks or printing invoices are performed more effectively on a batch basis. Many organizations still use batch-processing techniques.

### (ii) The first period (1960 to 1970) - EDP to MIS

After the first business computer was developed in 1951 by J. Lyon and Co, special IS groups of departments began to emerge in the organization, signaling the beginning of a new era, from EDP to MIS. It was then developed further and used widely during the 1960s and early 1970s. (Wikipedia. "EDP". 2015). During this period, another role was added to the use of computers, which is the processing of data into useful informative reports. Management information systems or MIS thus evolved from TPS.

The focus of this new role is to develop business application that provides managerial end users with pre-defined management reports that would give managers the information they needed for decision-making purposes. This era also marks the development period when the focus of organizations shifted slowly from merely simply automating basic business processes in the 1950s to consolidating the control within the data processing function.

**Management Information Systems (MIS)-** provide information in the form of pre-specified reports and displays to support business decision-making. Examples of output from MIS are sales analysis, production performance and cost trend reporting systems.

Typically, MIS generates three basic types of information i.e. Detailed, summary and exception. Detailed information reports typically confirm transaction-processing activities. A detailed Order Report is an example of a detailed report. Summary information consolidates data into a format that an individual can review quickly and easily, while exception information filters data to report information that is outside of a normal condition. An example of exception report is an inventory report. The report may notify the purchasing department of items it needs to reorder. Exception reports help managers save time because they do not have to search through a detailed report for exceptions. Exception reports thus help managers focus on situations that require immediate decisions or actions.

### (iii) The Second period (1970 to 1980) - PC and DSS

In this second era, technological advancement continued to soar. The major advancement was the introduction of the personal computers (PC). With the introduction of PCs, organizations began to distribute their computing/processing power across the organization. As the range of users broadened, organizations took a stronger management orientation to their traditionally technical-oriented approach to IS operations. The movement started focusing on "interactive computer- based system" to aid decision-makers in resolving problems.

As a result of that, the pre-defined management reports were not sufficient to meet many of the decision-making needs of management anymore. In order to satisfy such needs, the concept of decision support systems (DSS) was bom. The new role of information systems was to provide managerial end users with ad-hoc and interactive support of their decision-making process.

DSS uses data from internal and/or external sources. Internal sources of data might include sales, manufacturing, inventory or financial data from an organization's database. External sources could include interest rates, population trends or material pricing. Managers that use DSS can manipulate the data used for DSS to help with decisions. A database is a repository or data store that is organized for efficient access, search, retrieval and update. Physically, a database is usually stored on hard disks, magnetic tape, optical disks as well as cloud (storage hosting).

**Decision support systems (DSS) -** provide interactive ad-hoc support for the decision making process of managers and other business professionals. DSS serves the management, operations, and planning levels of an organization usually mid and higher management to make a decision. Examples of DSS are projected revenue figures based on new product sales assumptions, product pricing and risk analysis systems.

**(iv) The Third period (1980 to 1990) - EIS and the Internet**

During this era, many business units resorted to purchasing their own hardware and software to suit their departmental needs. This was the era of personal computing, giving rise to departmental computing. This trend led to new challenges of data incompatibility, connectivity and integrity across functional departments.

End users could now use their own computing resources to support their job requirements instead of waiting for the indirect support of a centralized corporate information services department. It became evident that most top executives did not use either MIS reports or the analytical modelling capabilities of DSS, so the concept of executive information systems (EIS) was developed. It is also known as an executive support system (ESS).

**Executive information systems (EIS) -** is a type of management information system intended to facilitate and support the information and decision-making needs of senior executives by providing easy access to both internal and external information relevant to meeting the strategic goals of the organization. It is commonly considered as a specialized form of DSS. Examples of the EIS are systems for easy access to analysis of business performance, actions of all competitors, and economic developments to support strategic planning.

During this period is also where PC hardware, software and telecommunications evolved rapidly as well as widespread adoption of the TCP/IP network or the Internet. It becomes a new phenomenon in IT industry.

**(v) The Fourth period (1990 to 2000) - Artificial Intelligence (AI), Expert systems (ES) and Knowledge management systems (KMS).**

This era marks a significant shift of IS technology and the business environment. The commercialization of the Internet enabled new methods of communication and ways of conducting business that were not possible in the previous eras. The internet allows the dissemination of knowledge to different parts of the world, regardless of time and space.

Moreover, breakthroughs occurred in the development and application of artificial intelligence (AI) techniques to business information systems. With less need for human intervention, knowledge workers could be freed up to handle more complex tasks. Expert systems (ES) and knowledge management systems (KMS) interrelated to each other. ES uses data from KM to generate desirable information system's output, for instance loan application approval system.

**Expert systems (ES) -** is a computer system that emulates the decision-making ability of human experts. Some ES are designed to take the place of human experts, while others are designed to aid them. For example, there are expert systems that can diagnose human illnesses, make financial forecasts and schedule routes for delivery vehicles. (Vladimir Zwass. 2015).

**Knowledge management system (KMS) -** is a knowledge-based system that supports the creation, organization and dissemination of business knowledge within the enterprise. Examples of KMS are intranet access and helpdesk systems.

During this period in the mid to late 1990s saw the revolutionary emergence of enterprise resource planning (ERP) systems. This organization-specific form of a strategic information system integrates all facets of a firm, including its planning, manufacturing, sales, resource management, human resource and marketing - virtually every business function.

**(vi) The fifth period (2000 - present) - e-Business, e-Commerce, Mobile and Cloud Computing**

The rapid growth of the internet, intranets, extranets and other interconnected global networks in the 1990s dramatically changed the capabilities of IS in business. Internet-based and web-enabled enterprise and global electronic business and commerce systems are becoming commonplace in the operations and management of today's business enterprises. Today's information systems are still doing the same basic things just like 50 years ago from transactions processing, records keeping, reporting management and support management to the accounting system as well as processes of the organization. What has changed today is greater connectivity across similar and dissimilar system components, much higher level of integration of system functions across applications, great network infrastructure and powerful machines with higher storage capacity.

The Internet and related technologies and applications have changed the way businesses operate and people work, and how information systems support business process, decision making and competitive advantage. Today, many businesses are making full use of Internet technologies to web-enable business processes and to create innovative e-business applications. E-business is the use of Internet technologies to work and empower business processes, e-commerce and enterprise collaboration within a company and with its customers, suppliers and other business stakeholders.

And finally, big data, mobile and cloud computing in the latest era of smart phones, tablets and social media, and the rapid growth of wireless network technology. Big data is a collection of data from traditional and digital sources inside and outside of an organization that represents a source for ongoing discovery and analysis. Cloud computing enables convenient, on-demand network access to a shared pool of configurable computing devices such as networks, servers, storage, applications and services that can be rapidly provisioned and released with minimal management effort or service provider interactions.

## 2.2 Basic Information Systems

**Q2. Define information systems.**

*Ans :*

An information system can be any organized combination of people, hardware, software, communication software and data resource that collects transformation or screening the information in an organization.

**Definition**

An information system can be defined as a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making, coordination and control in an organization.

**Examples of Information System**

A business is an example of an organizational system to an economic resource (input) is transformed by various business processes into goods and services (output).

Information system provides information on the operation of the system to management for the direction and maintenance of the system as it exchanges inputs and output with its environment.

Some examples of information systems include the following.

- Airline reservations (seat, booking, payment, schedules, boarding list, special needs, etc.).
- Bank operations (deposit, transfer, withdrawal) electronically with a distinguish payment gateways.
- Integration of department with the help of contemporary software's like ERP.
- Logistics management application to streamline the transportation system.

**(a) Feedback and control**

A system with feedback and control components is sometimes known as cybernetic system that is a self monitoring or self regulating system.

**(i) Feedback:** Feedback is a data about the performance of a system.

**(ii) Control :** Control involves monitoring and evolving feedback determines whether a system is moving towards the achievement of its goals. The control function makes necessary adjustments to a system input and possessing components to ensure that to produce proper output.

**Q3. Explain the role of information system in business.**

*Ans :*

An Information system supports the business Organizations in the following ways.

**(a) 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.

**(b) Support Operation of a Business Organization**

An IS supports operations of a business organization by giving timely information, maintenance and enhancement which provides flexibility in the operation of organizations.

**(c) Support Decision Making**

An IS supports the decision making by employee in their daily operations. It 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.

**(d) Strategies for an Organization**

Today each business is running in a competitive market. An IS supports the organization to evolve appropriate strategies for the business to assent in a competitive environment

**Q4. What are the components of information system.**

*Ans :*

**(a) People Resources**

- People are required for the operation of all information system.
- People Resources divided into two types

**(i) End-Users**

These are the people who use an information system or the information it produce.

**Ex:** Accounts, Sales Persons, Customers and Managers.

**(ii) Information system specialist**

These are the people who develop and also operate Information system.

**Ex:** System Managers, Programmers, Computer Operation

**(b) Data Resources**

Data resources of an Information system are typically organized in two parts:

(i) **Database:** Database holds processed and organized data.

(ii) **Knowledge Base:** It holds knowledge in a variety of forms such as facts, rules, and case examples.

**(c) Software Resources**

It includes all sets of information processing instruction. It is also two types:

(i) **Program:** Set of operating instructions the direct and computer hardware.

(ii) **Procedure:** Set of Information processing instructions needed by people.

**Ex:** Operating System, Spreadsheet Programs, and Word processor Programs.

**(d) Hardware Resources**

Include all physical devices and materials used in information processing.

It has also two types

(i) **Machines**

**Ex:** Computer, Video Monitor, Scanner

(ii) **Media:** Hardware in computer based Infor-mation system.

**Ex:** Floppy Disk, Magnetic Tape and Optical Disk.

Computer System

**Ex:** Microcomputers, Midrange Computers System, Large Mainframe

Computer Peripheral: Ex: Mouse, Key Board.

**(e) Network Resources**

These are the fundamental resource components of all information Systems. It has also two types:

(i) **Communication Media:**

**Ex:** Co-axial Cable, Twisted Paired Wire, Fibre Optics Cable, Microwave

System and Communication Satellite System.

(ii) **Network Support:**

Generally used for the operation and use of a communication network.

**Ex:** Modems, Internet Browser and Communication Control Software.

**Q5. What are the types of information?**

**(OR)**

**Explain the different types of information systems.**

**(OR)**

**Classify the different types of information systems.**

**(OR)**

**List and describe the types of information system.**

**(OR)**

**Discuss the types of information systems.**

*Ans :* **(Imp.)**

As more and more business functions have been automated, information systems have-'become increasingly specialized. The specialized systems can operate alone or they can be combined to create a larger system that performs different functions for different people, e.g: Google.

Information Systems are generally classified into the following categories:

1. Office Information Systems (OIS)
2. Transaction Processing Systems (TPS)
3. Management Information Systems (MIS)
4. Decision Support Systems (DSS)
5. Executive Information Systems (EIS)
6. Expert Systems (ES)
7. Electronic Data Processing (EDP)

**1. Office Information Systems (OIS)**

An office information system, or OIS (pronounced oh-eye-ess), is an information system that uses hardware, software and networks to enhance work flow and facilitate

communications among employees. Win an office information system, also described as office automation; employees perform tasks electronically using computers and other electronic devices, instead of manually. With an office information system, for example, a registration department might post the class schedule on the Internet and e-mail students when the schedule is updated. In a manual system, the registration department would photocopy the schedule and mail it to each student's house.

An office information system supports a range of business office activities such as creating and distributing graphics and/or documents, sending messages, scheduling, and accounting. All levels of users from executive management to nonmanagement employees utilize and benefit from the features of an OIS.

### 2. Transaction Processing Systems (TPS)

A transaction processing system (TPS) is an information system that captures and processes data generated during an organization's day-to-day transactions. A transaction is a business activity such as a deposit, payment, order or reservation.

Clerical staff typically perform the activities associated with transaction processing, which include the following:

1. Recording a business activity such as a student's registration, a customer's order, an employee's timecard or a client's payment.
2. Confirming an action or triggering a response, such as printing a student's schedule, sending a thank-you note to a customer, generating an employee's paycheck or issuing a receipt to a client.
3. Maintaining data, which involves adding new data, changing existing data, or removing unwanted data.

Transaction processing systems were among the first computerized systems developed to process business data - a function originally called data processing. Usually, the TPS computerized an existing manual system to allow for faster processing, reduced clerical costs and improved customer service.

### 3. Management Information Systems (MIS)

While computers were ideal for routine transaction processing, managers soon realized that the computers' capability of performing rapid calculations and data comparisons could produce meaningful information for management. Management information systems thus evolved out of transaction processing systems. A management information system, or MIS (pronounced em-eye-ess), is an information system that generates accurate, timely and organized information so managers and other users can make decisions, solve problems, supervise activities, and track progress. Because it generates reports on a regular basis, a management information system sometimes is called a management reporting system (MRS).

Management information systems often are integrated with transaction processing systems. To process a sales order, for example, the transaction processing system records the sale, updates the customer's account balance, and makes a deduction from inventory. Using this information, the related management information system can produce reports that recap daily sales activities; list customers with past due account balances; graph slow or fast selling products; and highlight inventory items that need reordering. A management information system focuses on generating information that management and other users need to perform their jobs.

### 4. Decision Support Systems (DSS)

Transaction processing and management information systems provide information on a regular basis. Frequently, however, users need information not provided in these'

reports to help them make decisions. A sales manager, for example, might need to determine how high to set yearly sales quotas based on increased sales and lowered product costs. Decision support systems help provide information to support such decisions.

A decision support system (DSS) is an information system designed to help users reach a decision when a decision-making situation arises. A variety of DSSs exist to help with a range of decisions. A decision support system uses data from internal and/or external sources. Internal sources of data might include sales, manufacturing, inventory, or financial data from an organization's database. Data from external sources could include interest rates, population trends, and costs of new housing construction or raw material pricing. Users of a DSS, often managers, can manipulate the data used in the DSS to help with decisions.

DSS uses data from

(i) Internal sources

(ii) External sources

**(i) Internal sources -** sales, manufacturing, inventory, or financial for an organizations database.

**(ii) External sources -** interest rates, population trends, cost of new housing construction/ raw material pricing.

**5. Executive Information Systems (EIS)**

EIS is designed to support the information needs of executive managers. Information in an EIS are presented in charts and tables that show trends, ratios and other managerial statistics and is stored in data warehouses.

**6. Expert Systems (ES)**

An expert system is an information system that captures and stores the knowledge of human experts and then imitates human reasoning and decision-making processes for those who have less expertise. Expert systems are composed of two main components: a knowledge base and inference rules. A knowledge base is the combined subject knowledge and experiences of the human experts. The inference rules are a set of logical judgments applied to the knowledge base each time a user describes a situation to the expert system.

Although expert systems can help decision-making at any level in an organization, non-management employees are the primary users who utilize them to help with job- related decisions. Expert systems also successfully have resolved such diverse problems as diagnosing illnesses, searching for oil and making soup.

**7. Electronic Data Processing (EDP)**

EDP (electronic data processing), an infrequently used term for what is today usually called "IS" (information services or systems) or "MIS" (management information services or systems), is the processing of data by a computer and its programs in an environment involving electronic communication. EDP evolved from "DP" (data processing), a term that was created when most computing input was physically put into the computer in punched card form and output as punched cards or paper reports.

## 2.3 Decision Making and MIS

**Q6. Define Decision Making. State the various types of decision.**

*Ans :* **(Imp.)**

**Types**

Decision making is to assess and make choices. This decision was taken after going through several calculations and alternative considerations. Before the choice is made, there are several stages that may be passed by the decision maker.

**1. Programmed Decision**

A programmed decision is routine and repetitive problem for which there exists well-

defined decision making procedures inorder to find out the best possible solution. In a structured problem, all phases (that is intelligence, design and choice), of a decision-making process are structured. This means that inputs, outputs and internal procedures for these phases can be specified. The objectives are clearly defined, whether the problem involves choosing optimal investment strategy or finding an appropriate inventory level. These structured decision provides solutions to common, routine and repetitive problems.

**2. Non-programmed Decision**

A non-programmed decision is one, for which none of the decision phases is structured. It is not possible to specify inputs, outputs or internal procedures for all the decision phases. This is because the decision is new and the decision maker have no idea about it.

There are different ways in which a computer can help the knowledge workers, to such decisions. The ways provided by computer, leave a lot of processing work on the workers of unstructured decisions.

**3. Semi-programmed Decision**

It is not completely programmed, but falls between programmed and non-programmed decisions. These decisions have some structured elements and some unstructured elements. It is possible to specify the structure for one or phases of decision making process, but not for all the phases.

Most of the organizational decisions fall under this category. Computers can deal with these types of decisions. The proper placement of a decision within these categories, depend up on how problem is being solved, which obviously depends on the thinking of the decision maker.

**Q7. Describe the process of decision making with information system.**

**(OR)**

**Explain simons model of decision making.**

*Ans :*

Herbert Simon made key contributions to enhance our understanding of the decision-making process. In fact, he pioneered the field of decision support systems. According to (Simon 1960) and his later work with (Newell 1972), decision-making is a process with distinct stages. He suggested for the first time the decision-making model of human beings. His model of decision-making has three stages:

1. **Intelligence** which deals with the problem identification and the data collection on the problem.
2. **Design** which deals with the generation of alternative solutions to the problem at hand.
3. **Choice** which is selecting the 'best' solution from amongst the alternative solutions using some criterion.

The figure given below depicts Simon's decision-making model clearly.

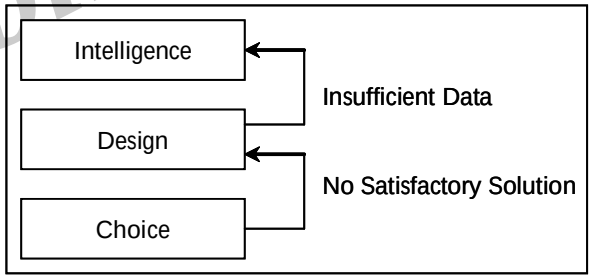



**Fig. : Simons Model**

**1. Intelligence Phase**

This is the first step towards the decision-making process. In this step the decision-maker identifies/detects the problem or opportunity. A problem in the managerial context is detecting anything that is not according to the plan, rule or standard. An example of problem is the detection of sudden very high attrition for the present month by a HR manager among workers. Opportunity seeking on the other hand is the identification of a promising circumstance that might lead to better results. An example of identification of opportunity is-a marketing manager gets to know that two

of his competitors will shut down operations (demand being constant) for some reason in the next three months, this means that he will be able to sell more in the market.

Thus, we see that either in the case of a problem or for the purpose of opportunity seeking the decision-making process is initiated and the first stage is the clear understanding of the stimulus that triggers this process. So if a problem/opportunity triggers this process then the first stage deals with the complete understanding of the problem/opportunity. Intelligence phase of decision-making process involves:

(a) Problem Searching

(b) Problem Formulation

**(a) Problem Searching:** For searching the problem, the reality or actual is compared to some standards. Differences are measured & the differences are evaluated to determine whether there is any problem or not.

**(b) Problem Formulation:** When the problem is identified, there is always a risk of solving the wrong problem. In problem formulation, establishing relations with some problem solved earlier or an analogy proves quite useful.

**2. Design Phase**

Design is the process of designing solution outlines for the problem. Alternative solutions are designed to solve the same problem. Each alternative solution is evaluated after gathering data about the solution. The evaluation is done on the basic of criteria to identify the positive and negative aspects of each solution. Quantitative tools and models are used to arrive at these solutions. At this stage the solutions are only outlines of actual solutions and are meant for analysis of their suitability alone. A lot of creativity and innovation is required to design solutions.

**3. Choice Phase**

It is the stage in which the possible solutions are compared against one another to find out the most suitable solution. The 'best' solution may be identified using quantitative tools like decision tree analysis or qualitative tools like the six thinking hats technique, force field analysis, etc.

This is not as easy as it sounds because each solution presents a scenario and the problem itself may have multiple objectives making the choice process a very difficult one. Also uncertainty about the outcomes and scenarios make the choice of a single solution difficult.

**Q8. Discuss various techniques used in decision making.**

*Ans :*

Before we discuss the importance of DSS, let us also have a brief look at some of the techniques, which are often used in decision-making support. These techniques that follow complex approaches, are discussed, in brief, here:

**(i) Simulation**

In this approach, a mathematical model of the situation is created. Main decision variables are defined and the model is operated under different assumptions or with different starting conditions to help explore alternative paths for the real situation.

**(ii) Optimisation**

In optimisation technique, a mathematical model of the situation is developed. The model is designed so that optimisation techniques can be used to search for optimal values of decision variables.

**(iii) OLAP and Data Mining**

It uses statistical techniques to analyse business results and find hidden relationships.

**(iv) Expert Systems**

Here an expert's view of an area of knowledge in terms of facts and rules are summarised and then the facts and rules to a particular situation are applied to help someone else decide what to do.

**(v) Neural Networks**

It starts with a large set of coded examples that represents the range and frequency of possibilities in the situation being studied. Neural networks apply automated statistical 'learning' techniques to find the statistical parameters that best present correlations between groups of characteristics within the trading set.

**(vi) Fuzzy Logic**

In this approach, decision processes are controlled using logic systems that replace 'either - or' logic with logic based on relative degrees of inclusion in sets.

**(vii) Case-based Reasoning**

This approach creates a database of examples that may help in making decision. Adds another example to the database when the database does not cover a new situation.

**(viii) Intelligent Agents**

In this technique, decision parameters are specified for a computerised 'agent' that searches one or more databases to find a specific answer, such as the lowest price for a particular mobile set.

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**Q9. Explain various types of decision making?**

*Ans :* **(Imp.)**

Organisational decisions differ in a number of ways. These differences affect the development of alternatives and the choice among them. They also affect the design of information system support for decision activities. The following bases are important to classify decision.

**1. Purpose of Decision-making**

On the basis of the purpose of the decision-making activities, Robert B. Anthony (1965) has differentiated organisational decisions into three categories, namely, strategic planning decisions, management control decisions and operational control decisions.

**(i) Strategic planning decisions** are those decisions in which the decision-maker develops objectives and allocates resources to achieve these objectives. Decisions in this category are of long-time period and usually involve a large investment and effort. Such decisions are taken by strategic planning level (top level) managers. Examples of such decisions may include introduction of a new product, acquisition of another firm, etc.

**(ii) Management control decisions** are taken by management control level (middle level) managers and deal with the use of resources in the organisation. Analysis of variance, product mix, planning decisions, fall in this category of decisions.

**(iii) Operational control decisions** deal with the day-to-day problems that affect the operation of the organisation. For example, production scheduling decisions and inventory control decisions like the product to be produced for the day or the items and their quantities to be ordered are operational control decisions. Such type of decisions are normally taken by managers at the operational level (bottom level) of the management hierarchy in the organisation.

**2. Level of Programmability**

Simon (1965) on the basis of the level of the programmability of a decision, proposed two types of decisions: programmed and non-programmed, also known as structured and

unstructured decisions (Gorry and Scott Morton, 1971). However, there is no distinct line of demarcation between the two types of decisions, rather, they exhibit as continuum for the classification of decisions.

**(i) Programmed/Structured Decisions:** Programmed or structured decisions are those decisions, which are well defined and some specified procedure or some decision rule may be applied to reach a decision. Such decisions are routine and repetitive and require little time for developing alternatives in the design phase. Programmed or structured decisions have traditionally been made through habit, by operating procedures or with other accepted tools.

**(ii) Non-programmed/Unstructured Decisions:** Decisions which are not well-defined and have no pre-specified procedure or decision rule are known as unstructured or non-programmed decisions. These decisions are novel ones, which may range from one-time decisions relating to a crisis (such as a catastrophe at the location of the unit) to decisions relating to recurring problems where conditions change so frequently and to such an extent that decision rules cannot be specified. For these decisions, sufficient time has to be spent in the design phase. Unstructured decisions tend to be solved through judgement, intuition and the rule of thumb. Modem approaches to such decisions include special data analysis on computers, heuristic techniques, etc.

| Class | Operational Control | Management Control | Strategic Planning |
|---|---|---|---|
| Structured | Order processing<br>Accounts receivable | Budget analysis | Warehouse location |
| Semi-structured | Inventory control<br>Production scheduling | Analysis of variance | Introduction of new product |
| Unstructured | Cash management<br>Long-term forecast | Budget formulation | R&D Planning |

**Table : Different Classes of Decisions**



### 3. Knowledge of Outcomes

Another approach of classifying decisions is the level of knowledge of outcomes. An outcome defines what will happen if a decision is made or course of action taken. When there are more than one alternative, the knowledge of outcome becomes important. On the basis of the level of knowledge of outcomes, decision-making can be classified into three categories.

(i) Decision under certainty,

(ii) Decision under risk, and

(iii) Decision under uncertainty.

**(i) Decision Under Certainty:** Decision-making under certainty takes place when the outcome of each alternative is fully known. There is only one outcome for each alternative. In such a situation, the decision-maker is required to compute the optimal alternative or outcome. Various optimisation techniques may be used for such decisions.

**(ii) Decision under risk:** Decision-making under risk occurs when thee is a possibility of multiple outcomes of each alternative and a probability of occurrence can be attached to each outcome.

Such a decision-making is also similar to decision-making under certainty, where instead of optimising outcomes, the general rule is to optimise the expected outcome. The decision-making is assured to be rational.

**(iii) Decision under uncertainty:** Decision-making under uncertainty takes place when there are a number of outcomes for each alternative and the probabilities of their occurrence are not known. Optimisation criteria cannot be applied for making decisions under uncertainty because there is no knowledge of the probabilities. Under such a situation, different people take decisions applying different decision rules.

## 2.4 Decision Assisting Information Systems

**Q10. What do you mean decision support systems (DSS)? State the characteristics of decision support systems?**

*Ans :* **(Imp.)**

**Meaning**

The term DSS refers to a class of systems, which supports the process of making decisions. The Emphasis is on "support" rather than on automation of decision. DSS allow the decision maker to retrieve data and test alternative solutions during the process of problem solving.

**Definition**

**According to Scott Morton,** "DSS as interactive computer based systems, which help decision makers utilize data and model to solve unstructured problems".

**Examples of DSS:**

- Group DSS
- Computer support Co-operative work
- Logistics systems
- Financial planning system

**Characteristics**

- **Provide rapid access to information:** some DSS provides fast the dashboard of a car or truck are used to see how the vehicle is running.
- **Handle large amount of data from different sources:** advanced database management systems and data warehouses have allowed decision makers to search for information with a DSS even when some data resides in different databases on different computer systems or network.
- **Provide report and presentation flexibility:** managers can get the information they want presented in a format that suits their needs. Produce text, tables, line drawings, pie charts, trend lines, and more.
- **Support drill down analysis:** a manager can get more levels of detail when needed by drilling down through data.
- **Perform complex, sophisticated analysis and comparisons using advanced software packages:** marketing research surveys.

## 2.5 Concepts of Balanced MIS Effectiveness and Efficiency Criteria

**Q11. Define Balanced MIS ? Explain the concept of efficiency and effectiveness and its impact of information technology / information systems.**

*Ans :* **(Imp.)**

**Balanced MIS**

The Balanced MIS is an approach to performance measurement that combines traditional financial measures with non-financial measures to provide managers with richer and more relevant information about activities they are managing.

**Efficiency and Effectiveness**

It is often said that the use of information technology makes our work more effective, more efficient, or both.

Effectiveness defines the degree to which a goal is achieved. Thus a system is more or less effective depending upon

1. how much of its goal it achieves and
2. the degree to which it achieves better outcomes than other systems do.

Efficiency is determined by the relationship between resources expended and the benefits gained in achieving a goal. Expressed mathematically,

$$\text{Efficient} = \frac{\text{Benefits}}{\text{Cost}}$$

Thus, one system is more efficient than another if its operating costs are lower to the same or better quality product, or if its product's quality is greater for the same or lower costs. The term productivity is commonly used as synonym for efficiency.

However, productivity specifically refers to the efficiency of human resources. Productivity improves when fewer workers are required to produce the same amount of output, or, alternately, when the same number of workers produce a larger output. This is why IS professionals often speak of productivity tools, which are software applications that help workers produce more in less time. The closet the result of an effort is to the ultimate goal, the more effective the effort. The fewer the resources spent on achieving a goal, the more efficient the effort.

Suppose your goal is to design a new car that reaches a speed of 60 miles per hour in 10 seconds. If you manage to build it, then you produce the product effectively. If the car does not meet the requirement, your effort is ineffective. If your competitor makes a car with the same features and performance but uses fewer people and fewer other resources, then your competitor is as effective but more efficient than you.

ISs contribute to both the effectiveness and efficiency of businesses, especially when positioned in specific business functions, such as accounting, finance and engineering, and when used to help companies achieve their goals more quickly by facilitating collaborative work. ISs can be used in a wide variety of applications.

# Short Question and Answers

**1. Define information systems.**

*Ans :*

An information system can be any organized combination of people, hardware, software, communication software and data resource that collects transformation or screening the information in an organization.

**Definition**

An information system can be defined as a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making, coordination and control in an organization.

**Examples of Information System**

A business is an example of an organizational system to an economic resource (input) is transformed by various business processes into goods and services (output).

Information system provides information on the operation of the system to management for the direction and maintenance of the system as it exchanges inputs and output with its environment.

Some examples of information systems include the following.

- Airline reservations (seat, booking, payment, schedules, boarding list, special needs, etc.).
- Bank operations (deposit, transfer, withdrawal) electronically with a distinguish payment gateways.
- Integration of department with the help of contemporary software's like ERP.
- Logistics management application to streamline the transportation system.

**2. Office Information Systems.**

*Ans :*

An office information system, or OIS (pronounced oh-eye-ess), is an information system that uses hardware, software and networks to enhance work flow and facilitate communications among employees. Win an office information system, also described as office automation; employees perform tasks electronically using computers and other electronic devices, instead of manually. With an office information system, for example, a registration department might post the class schedule on the Internet and e-mail students when the schedule is updated. In a manual system, the registration department would photocopy the schedule and mail it to each student's house.

An office information system supports a range of business office activities such as creating and distributing graphics and/or documents, sending messages, scheduling, and accounting. All levels of users from executive management to nonmanagement employees utilize and benefit from the features of an OIS.

**3. Transaction Processing Systems.**

*Ans :*

A transaction processing system (TPS) is an information system that captures and processes data generated during an organization's day-to-day transactions. A transaction is a business activity such as a deposit, payment, order or reservation.

Clerical staff typically perform the activities associated with transaction processing, which include the following:

1. Recording a business activity such as a student's registration, a customer's order, an employee's timecard or a client's payment.
2. Confirming an action or triggering a response, such as printing a student's schedule, sending a thank-you note to a customer, generating an employee's paycheck or issuing a receipt to a client.
3. Maintaining data, which involves adding new data, changing existing data, or removing unwanted data.

Transaction processing systems were among the first computerized systems developed to process business data - a function originally called data processing. Usually, the TPS computerized an existing manual system to allow for faster processing, reduced clerical costs and improved customer service.

**4. Executive Information Systems.**

*Ans :*

EIS is designed to support the information needs of executive managers. Information in an EIS are presented in charts and tables that show trends, ratios and other managerial statistics and is stored in data warehouses.

**5. Expert Systems**

*Ans :*

An expert system is an information system that captures and stores the knowledge of human experts and then imitates human reasoning and decision-making processes for those who have less expertise. Expert systems are composed of two main components: a knowledge base and inference rules. A knowledge base is the combined subject knowledge and experiences of the human experts. The inference rules are a set of logical judgments applied to the knowledge base each time a user describes a situation to the expert system.

Although expert systems can help decision-making at any level in an organization, non-management employees are the primary users who utilize them to help with job- related decisions. Expert systems also successfully have resolved such diverse problems as diagnosing illnesses, searching for oil and making soup.

**6. Electronic Data Processing.**

*Ans :*

EDP (electronic data processing), an infrequently used term for what is today usually called "IS" (information services or systems) or "MIS" (management information services or systems), is the processing of data by a computer and its programs in an environment involving electronic communi-cation. EDP evolved from "DP" (data processing), a term that was created when most computing input was physically put into the computer in punched card form and output as punched cards or paper reports.

**7. Define Decision Making.**

*Ans :*

**Types**

Decision making is to assess and make choices. This decision was taken after going through several calculations and alternative considerations. Before the choice is made, there are several stages that may be passed by the decision maker.

**8. Programmed Decision.**

*Ans :*

A programmed decision is routine and repetitive problem for which there exists well-defined decision making procedures inorder to find out the best possible solution. In a structured problem, all phases (that is intelligence, design and choice), of a decision-making process are structured. This means that inputs, outputs and internal procedures for these phases can be specified. The objectives are clearly defined, whether the problem involves choosing optimal investment strategy or finding an appropriate inventory level. These structured decision provides solutions to common, routine and repetitive problems.

**9. Non-programmed Decision.**

*Ans :*

A non-programmed decision is one, for which none of the decision phases is structured. It is not possible to specify inputs, outputs or internal procedures for all the decision phases. This is because the decision is new and the decision maker have no idea about it.

There are different ways in which a computer can help the knowledge workers, to such decisions. The ways provided by computer, leave a lot of processing work on the workers of unstructured decisions.

**10. Semi-programmed Decision**

*Ans :*

It is not completely programmed, but falls between programmed and non-programmed decisions. These decisions have some structured elements and some unstructured elements. It is possible to specify the structure for one or phases of decision making process, but not for all the phases.

Most of the organizational decisions fall under this category. Computers can deal with these types of decisions. The proper placement of a decision within these categories, depend up on how problem is being solved, which obviously depends on the thinking of the decision maker.

**11. Define Balanced MIS.**

*Ans :*

The Balanced MIS is an approach to performance measurement that combines traditional financial measures with non-financial measures to provide managers with richer and more relevant information about activities they are managing.

**12. Effectiveness.**

*Ans :*

Effectiveness defines the degree to which a goal is achieved. Thus a system is more or less effective depending upon

1. how much of its goal it achieves and
2. the degree to which it achieves better outcomes than other systems do.

Efficiency is determined by the relationship between resources expended and the benefits gained in achieving a goal. Expressed mathematically,

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However, productivity specifically refers to the efficiency of human resources. Productivity improves when fewer workers are required to produce the same amount of output, or, alternately, when the same number of workers produce a larger output. This is why IS professionals often speak of productivity tools, which are software applications that help workers produce more in less time. The closet the result of an effort is to the ultimate goal, the more effective the effort. The fewer the resources spent on achieving a goal, the more efficient the effort.

# Choose the Correct Answers

1. Decision-Table is a way [ a ]
   (a) Of representing multiple conditions
   (b) Of representing the information flow
   (c) To get an accurate picture of the system
   (d) All of these
2. Information systems support an organization's business operations, managerial decision making and strategic competitive advantage. Such system is called [ c ]
   (a) Business process reengineering (b) Globalization
   (c) Roles of information systems (d) Competitive advantage
3. Mistakes made in the system analyses stage show up in _____. [ c ]
   (a) System design (b) System development
   (c) Implementation (d) All of these
4. The document listing all procedure and regulations that generally govern an organization is the _____. [ d ]
   (a) Administrative policy manual (b) Personal policy book
   (c) Procedures log (d) Organization manual
5. The flow of information through MIS is [ a ]
   (a) need dependent (b) organization dependent
   (c) information dependent (d) management dependent
6. Critical information for top management is provided by _____ information system. [ b ]
   (a) expert (b) executive
   (c) decision (d) managerial
7. Which of the following is not a characteristic of good information? [ a ]
   (a) interchangeability (b) relevance
   (c) cost effectiveness (d) timeliness
8. The value of information is directly linked to _____. [ a ]
   (a) its accuracy and completeness
   (b) its verifiability
   (c) its simplicity and security
   (d) how it helps decision makers achieve organizational goals
9. _____ often referred to as “rules of thumb,” are commonly accepted guidelines or procedures that usually lead to a good decision. [ d ]
   (a) optimization models (b) satisfying models
   (c) heuristics (d) programmed decisions
10. In among the firms executives, managers, and supervisors are comes under _____ of workers. [ a ]
   (a) knowledge (b) leader
   (c) informer (d) higher level

# Fill in the Blanks

1. IT is all about managing _____ and making use of it for the betterment of business.
2. _____ Captures raw data from organization or external environment.
3. _____ Converts raw data into meaningful form, the output.
4. _____ Transfers processed information to people of activities that use it.
5. _____ is a type of information that collects, stores, modifies and retrieve the data transactions of an organization's day-to-day transactions.
6. _____ is a type of management information system intended to facilitate and support the information and decision-making needs of senior executives by providing easy access.
7. _____ is a computer system that emulates the decision-making ability of human experts.
8. _____ are the people who use an information system or the information it produce.
9. _____ Include all physical devices and materials used in information processing.
10. _____ which deals with the problem identification and the data collection on the problem.



**ANSWERS**

1. Technology
2. Input
3. Processing
4. Output
5. Transaction processing systems
6. Executive information systems
7. Expert systems
8. End-Users
9. Hardware Resources
10. Intelligence

# One Mark Answers

**1. Define the term efficiency.**

*Ans :*

Efficiency can be defined as the performance of a system that uses lowest resources and provides better output.

**2. Define DSS.**

*Ans :*

DSS is an interactive computer-based system that assist the decision makers of an organization to use the data and model for solving the unstructured problems.

**3. Define decision makers.**

*Ans :*

Decision makers are users who make decisions in the areas like business, non-profit sector, government etc.

**4. Define Management Information System.**

*Ans :*

MIS is a type of information system that enables the managers and decision makers in making appropriate decisions by providing necessary information.

**5. Define process control system.**

*Ans :*

Process control systems are those systems that are responsible for monitoring and controlling the physical processes electronically.

UNIT III

**DEVELOPMENT OF MIS:**

Methodology and Tools/Techniques for Systematic Identification, Evaluation and Modification of MIS.Enterprise Resource Planning: Introduction, Basics of ERP, Evolution of ERP, Enterprise Systems in Large Organizations, Benefits and Challenges of Enterprise Systems, EEnterprise System : Introduction: Managing the E-enterprise, Organisation of Business in an Eenterprise, E-business, E-commerce, E-communication, E-collaboration.

## 3.1 Methodology and Tools / Techniques for Systematic Identification

**Q1. Explain various methodologies used for systematic identification.**

*Ans :* **(Imp.)**

There are alternative methodologies for modeling and designing systems. Structured methodologies and object-oriented development are the most prominent.

### 1. Structured Methodologies

Structured methodologies have been used to document, analyze, and design information systems since the 1970s. Structured refers to the fact that the techniques are step by step, with each step building on the previous one. Structured methodologies are top-down, progressing from the highest,' most abstract level to the lowest level of detail from the general to the specific.

Structured development methods are process-oriented, focusing primarily on modeling the processes, or actions that capture, store, manipulate, and distribute data as the data flow through a system. These methods separate data from processes. A separate programming procedure must be written every time someone wants to take an action on a particular piece of data. The procedures act on data that the program passes to them.

The primary tool for representing a system's component processes and the flow of data between them is the data flow diagram (DFD). The data flow diagram offers a logical graphic model of information flow, partitioning a system into modules that show manageable levels of detail. It rigorously specifies the processes or transformations that occur within each module and the interfaces that exist between them.

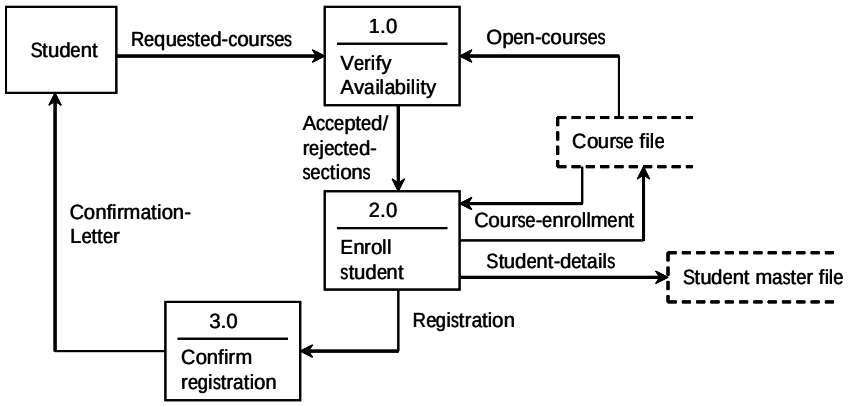



**Fig. Data Flow Diagram for Mail in University Registration System**

Another tool for structured analysis is a data dictionary, which contains information about individual pieces of data and data groupings within a system. The data dictionary defines the contents of data flows and data stores so that systems builders understand exactly what pieces of data they contain. Process specifications describe the transformation occurring within the lowest level of the data flow diagrams. They express the logic for each process.

In structured methodology, software design is modeled using hierarchical structure charts. The structure chart is a top-down chart, showing each level of design, its relationship to other levels, and its place in the overall design structure. The design first considers the main function of a program or system, then breaks this function into subfunctions, and decomposes each subfunction until the lowest level of detail has been reached. Figure shows a high-level structure chart for a payroll system. If a design has too many levels to fit onto one structure chart, it can be broken down further on more detailed structure charts. A structure chart may document one program, one system (a set of programs), or part of one program.

### 2. Object-oriented Development

Object-oriented development addresses these issues. Object-oriented development uses the object as the basic unit of systems analysis and design. An object combines data and the specific processes that operate on those data. Data encapsulated in an object can be accessed and modified only by the operations, or methods, associated with that object. Instead of passing data to procedures, programs send a message for an object to perform an operation that is already embedded in it. The system is modeled as a collection of objects and the relationships among them. Because processing logic resides within objects rather that in separate software programs, objects must collaborate with each other to make the system work.



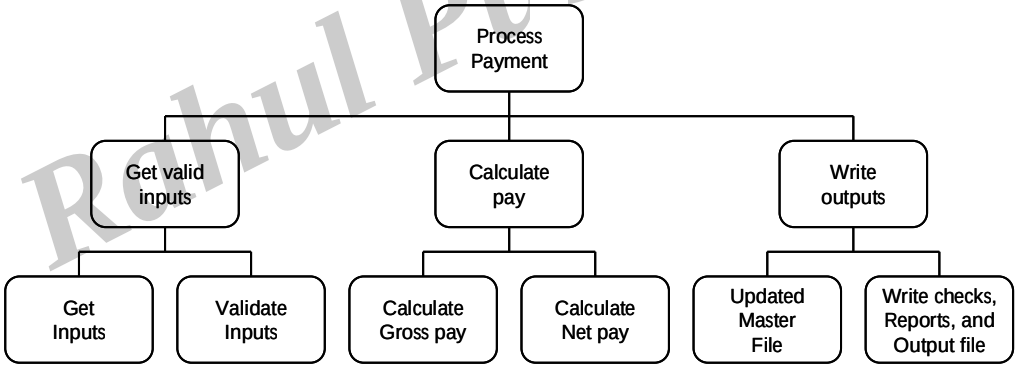



**Fig. High Level Structure Chart for a Payroll System**

Object-oriented modeling is based on the concepts of *class* and *inheritance.* Objects belonging to a certain class, or general categories of similar objects, have the features of that class. Classes of objects in turn can inherit all the structure and behaviors of a more general class and then add variables and behaviors unique to each object. New classes of objects are created by choosing an existing class and specifying how the newness differs from the existing class, instead of starting from scratch each time.

**Q2. What is meant by structured analysis ?**

**(OR)**

**What is structured analysis ?**

*Ans :*

Structured analysis is a structured methodology that is responsible for performing the following activities.

(i) Defining inputs, processes and outputs that are related to the system.

(ii) Developing a logical mode of the proposed system.

(iii) Partitioning the entire system into many manageable modules each of which defines different level of details.

(iv) Defining the processes or transformations to be performed on every individual modules.

(v) Defining the interfaces that exist between the modules.

The advantage of performing structured analysis is that it helps the analyst in detecting the errors in the early stage of analysis process, thereby reducing the time as well as cost incurred, when compared to the cost and time incurred in detecting errors in the later stages of development process.

**Tools for Performing Structured System Analysis**

Structured analysis is performed using graphical tools that are easily understood by the users. Some of the important tools are as follows

1. Data flow diagrams
2. Data dictionary
3. Structured Chart
4. Decision trees
5. Decision tables.

**Q3. Explain briefly about data flow diagram with an example.**

*Ans :*

A Data Flow Diagram (DFD) is a graphical representation normally designed by a system analyst and is used as a reference point by the programmer which portrays the "flow" of data through an information system. It is primarily used for the visualization of data processing for the structured design of an information system. It is common practice for a database designer to begin the process by drawing a context-level DFD, which shows the interaction between the system and outside entities. This context-level DFD is then "exploded" to show more detail of the system that is begin modeled.

- This is also called a *bubble* chart.
- It has four symbols: Square (defines sources), arrow (defines data flow), circle (defines process) and open rectangle (defines data store)
- It is the starting point in the system design that decomposes requirements to the lowest level of detail.
- It identifies major transformations that eventually become programs in system design.
- It consists of a series of bubbles joined by lines. Bubbles represent transformations and the lines represent the data flows in the system.

**Symbols**

Data Flow Diagrams are composed of the four basic symbols shown below. Any system can be represented at any level of detail by these four symbols.

(i) External Entity

(ii) Data Flow

(iii) Data Store

(iv) Process

**(i) External Entity**

The External Entity symbol represents sources of data to the system or destinations of data from the system. External entities determine the system boundary.

They are external to the system being studied. They are often beyond the area of influence

of the developer. These can represent another system or subsystem. These go on margins/edges of data flow diagram. External entities are named with appropriate name.

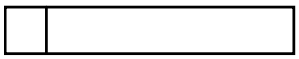
**(ii) Data Flow**

The Data Flow symbol represents movement of data. Data flow represents the input (or output) of data to (or from) a process ("data in motion"). Data flows only data, not control. Represent the minimum essential data the process needs.

Using only the minimum essential data reduces the dependence between processes. Data flows must begin and/or end at a process. Data flows are always named. Names should be some identifying noun. For example, order, payment, complaint.

**(iii) Data Store**

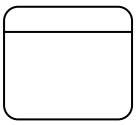
The Data Store symbol represents data that is not moving. Data Stores are repository for data that are temporarily or permanently recorded within the system. It is an "inventory" of data. These are common link between data and process models. Only processes may connect with data stores. There can be two or more systems that share a data store. This can occur in the case of one system updating the data store, while the other system only accesses the data.



Data stores are named with an appropriate name, not to include the word "file", Names should consist of plural nouns describing the collection of data. Like customers, orders, and products. These may be duplicated. These are detailed in the data dictionary or with data description diagrams.

**(iv) Process**

The Process symbol represents an activity that transforms or manipulates the data. Processes are work or actions performed on incoming data flows to produce outgoing data flows. These show data transformation or change. Data coming into a process must be "worked on" (or) transformed in some way. Thus, all processes must have inputs and outputs.



In some (rare) cases, data inputs or outputs will only be shown at more detailed levels of the diagrams. Each process in always "running" and ready to accept data. Major functions of processes are computations and making decisions. Each process may have dramatically different timing: yearly, weekly, daily.

**Q4. Explain briefly about Data Dictionary.**

*Ans :*

It is a structured repository of data. Although we give descriptive names to the data flows, process and data stores in a DFD, it does not give the details. Hence to keep the details of the contents of data flows, process and data stores we also require a Data Dictionary. This is a structured repository of data. It clearly documents the list of contents of all data flows, processes and data stores.

The three classes to be defined are:

1. **Data Elements:** This the smallest unit of data. Further decomposition is not possible. The ISO-11179 Standards give rules for creating Data Element names.
2. **Data Structure:** It is a group of Data Elements which together form as a unit in a data structure.
3. **Data flows and Data stores:** Data flows are data structured in motion. Data Stores are data structures in store. (Data structures in a data store - a data store is a location where data structures are temporarily located).

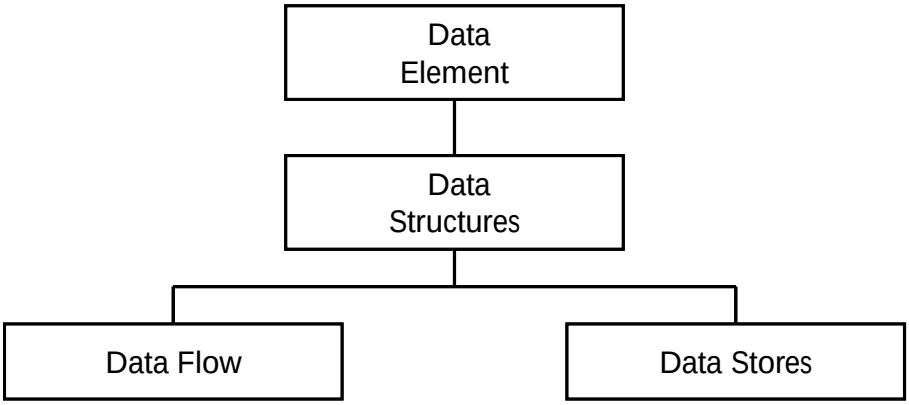



**Fig.: Logical Data Description Hierarchy**

### Structured Chart

In structured methodology, software design is modeled using hierarchical structure charts. The structure chart is a top-down chart, showing each level of design, its relationship to other levels, and its place in the overall design structure. The design first considers the main function of a program or system, then breaks this function into subfunctions, and decomposes each subfunction until the lowest level of detail has been reached.

It shows a high-level structure chart for a payroll system. If a design has too many levels to fit onto one structure chart, it can be broken down further on more detailed structure charts. A structure chart may document one program, one system (a set of programs), or part of one program.

**Q5. Explain briefly about decision trees. What are the advantages and disadvantages of decision trees.**

*Ans :*

### Meaning

The decision tree is a tree-structure, where each non-leaf node represents the test on an attribute, branches represents the outcome of the test and the leaf nodes represents the class labels.

The decision tree shown in the above figure, enables the organization to identify the number of students who are going to join a software company. Some decision trees are binary and some trees are nonbinary.

Decision trees are mostly used for classification rules for tuples which don't have class label identifier for them. The class predictions can be made by traversing from root node to the leaf node.

### Advantages

- Easy to understand
- Map nicely to a set of business rules
- Applied to real problems
- Make no prior assumptions about the data
- Able to process both numerical and categorical data

**Disadvantages**

- Output attribute must be categorical
- Limited to one output attribute
- Decision tree algorithms are unstable
- Trees created from numeric datasets can be complex

**Q6. Explain briefly about Decision Tables.**

*Ans :*

A decision table is a table of contingencies for defining a problem and the actions that need to be taken for it. It is a single representation of the relationships between conditions and actions, these pairs of condition sets and actions sets are known as rules. A condition is usually given a value of 'Y' for 'Yes, it is true", 'N' for 'No' and a dash for 'Do not care' in each rule. A decision tree fails to tell us what conditions to test. Where a decision table wins over a decision tree it that it can clearly call out the conditions that need to be tested. Whereas a decision tree fails to tell us what conditions to test, a decision table can clearly call out the conditions to test. Another advantage is that a decision table can be used to generate code in a procedural application language which is optimized for performance based on the expected likelihood of a rule being valid in the data.

**It has following features:**

- It defines problems and action that has to be taken.
- It's a relationship between condition and action.
- It has two parts: stub and entry.
- **Stub has two parts:**

  1. Condition Stub 2. Action Stub

- **Entry has two parts:**

  1. Condition Entry 2. Action Entry

| **Condition Stub** | **Condition Entry** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Preferred customer | Y | Y | Y | Y | N | N | N | N |
| Ordered more than `1,000 | Y | Y | N | N | Y | Y | N | N |
| Used our charge card | Y | N | Y | N | Y | N | Y | N |
| 5% discount | X | X | | | | | | |
| Additional 5% discount | X | | | | | | | |
| ` 25 bonus coupon | | X | | | | | | |
| ` 5 bonus coupon | | | X | X | X | X | X | |
| Action Stub | | | | | Action | Entry | | |

**Fig.: Decision Tables**

**Advantages**

- They provide concise descriptions of logically complex situations.
- They are easier to draw and change than flowcharts.
- They provide more compact documentation. A small table can replace several pages of flowcharts.
- It is also easier to follow a particular path down one column than through several flowcharts pages.

**Limitations**

- Large decision tables can become incomprehensible and difficult to modify.

**Q7. Explain the concept of CASE (Computer Aided Software Engineering)**

*Ans :*

Computer-aided software engineering (CASE)—sometimes called 'computer-aided systems engineering—provides software tools to automate the methodologies we have just described to reduce the amount of repetitive work the developer needs to do. CASE tools also facilitate the creation of clear documentation and the coordination of team development efforts. Team members can share their work easily by accessing each other's files to review or modify what has been done. Modest productivity benefits can also be achieved if the tools are used properly.

CASE tools provide automated graphics facilities for producing charts and diagrams, screen and report generators, data dictionaries, extensive reporting facilities, analysis and checking tools, code generators, and documentation generators. In general, CASE tools try to increase productivity and quality by:

- Enforcing a standard development methodology and design discipline.
- Improving communication between users and technical specialists.
- Organizing and correlating design components and providing rapid access to them using a design repository.
- Automating tedious and error-prone portions of analysis and design.
- Automating code generation and testing and control roll out.

CASE tools contain features for validating design diagrams and specifications. CASE tools thus support iterative design by automating revisions and changes and providing prototyping facilities. A CASE information repository stores all the information defined by the analysts during the project. The repository includes data flow diagrams, structure charts, entity-relationship diagrams, data definitions, process specifications, screen and report formats, notes and comments, and test results.

To be used effectively, CASE tools require organizational discipline. Every member of a development project must adhere to a common set of naming conventions and standards as well as to a development methodology. The best CASE tools enforce common methods and standards, which may discourage their use in situations where organizational discipline is lacking.

**Q8. List out various CASE tools in building information system.**

*Ans :* **(Imp.)**

The various approaches to build information system includes :

1. Traditional system life cycle
2. Prototyping
3. End user development
4. Application software packages and
5. Outsourcing

**1. Traditional system life cycle**

The systems life cycle is one of the conventional method for developing information systems. Originally, the life cycle methodology is a phased approach for

transforming the systems into formal stages by doing system development and segregating them. Although, the process as how to segregate the system is still under development stage.

Interestingly, the systems life cycle methodology operates by creating a formal division corresponding to labor between end users and information systems specialists. Subsequently, the task of analyzing the design of the system, implementation work are taken care by technical specialist team such as system analysts and programmers.

Finally, end users job is to restricted in providing information requirements and review of technical staff. Apart from this, it also focuses upon the formal specifications and paperwork. We also observe that the system life cycle is implemented for building large complex systems which demands, strict, formal requirements analysis, predefine specifications and tight controls on the systems building process. Along, the same lines, the approach can be costly, time consuming and inflexible. One advantage is that, the user is allowed to move back and forth in between the stages of life cycle. One such model is water fall model.

The life cycle approach is not adopted in small desktop systems which are less in structure and highly individualized.

## 2. Prototyping

Prototyping consists of building an experimental system rapidly and inexpensively for end users to evaluate. By interacting with the prototype, users can get a better idea of their information requirements. The prototype endorsed by the users can be used as a template to create the final system.

The prototype is a working version of an information system or part of the system, but it is meant to be only a preliminary model. Once operational, the prototype will be further refined until it conforms precisely to users' requirements. Once the design has been finalized, the prototype can be converted to a polished production system.

The process of building a preliminary design, trying it out, refining it, and trying again has been called an iterative process of systems development because the steps required to build a system can be repeated over and over again. Prototyping is more explicitly iterative than the conventional life cycle, and it actively promotes system design changes. It has been said that prototyping replaces unplanned rework with planned iteration, with each version more accurately reflecting users' requirements.

### Steps

It has a four-step model of the prototyping process, which consists of the following:

**Step 1 : Identify the user's basic requirements.** The system designer (usually an information systems specialist) works with the user only long enough to capture the user's basic information needs.

**Step 2 : Develop an Initial prototype.** The system designer creates a working prototype quickly, using tools for rapidly generating software.

**Step 3 : Use the prototype.** The user is encouraged to work with the system to determine how well the prototype meets his or her needs and to make suggestions for improving the prototype.

**Step 4 : Revise and enhance the prototype.** The system builder notes all changes the user requests and refines the prototype accordingly. After the prototype has been revised, the cycle returns to Step 3. Steps 3 and 4 are repeated until the user is satisfied.

### 3. End user development

Some types of information systems can be developed by end users with little or no formal assistance from technical specialists. This phenomenon is called end-user development. A series of software tools categorized as fourth-generation languages makes this possible. Fourth-generation languages are software tools that enable end users to create reports (or) develop software applications with minimal or no technical assistance. Some of these fourth- generation tools also enhance professional programmers' productivity.

Fourth-generation languages tend to be nonprocedural, (or) less procedural, than conventional programming languages. Procedural languages require specification of the sequence of steps, or procedures, that tell the computer what to do and how to do it. Non procedural languages need only specify what has to be accomplished rather than provide details about how to carry out the task.

End-user computing also poses organizational risks because it occurs outside of traditional mechanisms for information systems management and control. When systems are created rapidly, without a formal development methodology, testing and documentation may be inadequate. Control over data can be lost in systems outside the traditional information systems department. To help organizations maximize the benefits of end-user applications development, management should control the development of end-user applications by requiring cost justification of end-user information system projects and by establishing hardware, software, and quality standards for user-developed applications.

### 4. Application software packages

The software packages serves as a basis for creating applications. They eliminate the need for a company to rewrite its own software, if an existing software package is able to fulfill many of the organization's requirements. Thus, the use of existing software packages saves considerable time and money in system development.

Software packages are capable of performing customization wherein, the package is modified to address a unique requirement of an organization without effecting the package integrity. However, performing large amount of customization may require additional programming which in turn increases the amount of cost and time.

If software packages are used in system development process then package evaluation process becomes a part of system analysis.

### 5. Outsourcing

Outsourcing refers to the process where one organization purchases materials, parts or services from other organization instead of building those materials in-house or performing those services by themselves. Ideally, the functions which are outsourced are considered as non-core to the business.

**For example,** an automobile company does not posses skills, resources and assets that are required to develop a software for themselves. Therefore, the automobile firm may outsource the job of developing a software to a software development firm. This will be the best way for the firm as it saves time and will be less expensive than developing the software in-house.

#### Types

Basically, there are two types of outsourcings. They are,

#### (i) Domestic Outsourcing

If the vendor to which work is outsourced is within the country then it is called domestic outsourcing. This is mainly done by a firm if it does not have required skills, resource and assets for carryingout the work.

**(ii) Offshore Outsourcing**

If the vendor to which work is outsourced is located in a different country, then it is called offshore outsourcing. The decision for off shore outsourcing is mainly dependent on cost factor.

**Q9. What are the advantages and disadvantages of CASE Tools ?**

*Ans :*

**Advantages**

1. Produce system with a longer effective operational life.
2. Produces system that more closely meet user needs and requirements.
3. Produces system with excellent documentation.
4. Produces system that needs less systems support.
5. Produce more flexible system.

**Disadvantages**

1. Produce initial system that is more expensive to build and maintain.
2. Require more extensive and accurate definitions of user needs and requirements.
3. May be difficult to customize.
4. Require training of maintenance staff.
5. May be difficult to use with existing system.

## 3.2 Evaluation and Modification of MIS

**Q10. Explain in detail about the evaluation and modification of MIS.**

*Ans :*

**Evaluation of MIS**

Evaluation of MIS is an integral part of the management control process, in which the organisations determine or appraise the quality or worth of their information systems. In other words, evaluation of MIS is a process of measuring performance of organisational information systems. The feedback so obtained helps determine the necessary adjustments to be made in their information systems.''

**Modification of MIS**

**1. Change Management**

The changes implemented in design and functionality documents play a major role in developing a system. The two different types of changes in project development are as follows,

(i) The Changes Referred by the Client - These changes are advised by the clients as the given requirements are not achieved in the project.

(ii) The Changes Caused by Information System - These changes are occurred while developing the system.

**2. Organizational Changes**

The organizational changes lead to building a new information system. Some of the reasons to invest in the development of an information system are as follows,

(i) Basic survival

(ii) Improved efficiency

(iii) External factors

(iv) Competitive advantages.

## 3.3 Enterprise Resource Planning

### 3.3.1 Introduction, Basics of ERP

**Q11. Explain the concept of ERP ?**

*Ans :*

Enterprise Resource Planning (ERP) System may be defined as a highly integrated information system, which provides information for all the functional areas as well as at all the management levels of an organization. It may be understood as a

computer based system designed to process an organization's transactions and to integrate the various functions/departments/divisions within an organization. Thus, ERP System is a set of application software/package that provides operational, managerial, and strategic information for an enterprise.

Since the ERP system is an enterprise-wide framework that includes the various functional areas like Sales and Marketing; Production and Inventory Management; Accounts and Finance, Human Resources, etc., it is regarded as the business backbone of an organization.

ERP Systems serves as a cross-functional enterprise backbone that integrates all the processes of the business and help plan the resources of the organization. These systems help in focussing on production capacities, logistics management and working out financial implications of each decision rather than just computing costs. The basic philosophy of an ERP system is that business processes are to be integrated at all levels and all the resources of the organization are to be treated as common resources that are to be used most efficiently to satisfy its customers. As the needs of customers keep changing, ERP systems provide adaptability to these changing needs. ERP systems enable the manager to take an overall view of the business as a whole instead of having a myopic view (or narrow perspective) of business functions, and thus offer the benefits of synergy of various functions in achieving the goals and objectives of the organization. These systems also offer flexibility to business processes as the process itself, instead of some function in the process, is automated. All the required changes are implemented quickly with ERP systems. For example, SAP-R3, an ERP software package provides more than 700 processes that are automated and integrated with each other?

**Q12. Discuss the life cycle of ERP.**

**(OR)**

**Describe the various stages of ERP.**

**(OR)**

**Discuss how to develop ERP System.**

*Ans :* **(Imp.)**

**1. Pre-selection Screening**

This is the first phase of the ERP implementation system. When an organization decides to use the ERP system, it initially searches for the best ERP package. There are many packages available in the market and most of them are similar to each other.

The companies choose few packages to evaluate their features. It is better to limit the selection to not more than five. This is because, the process of package evaluation is time consuming. Each package has its own merits and demerits, the pre-selection screening process eliminates those packages which are of no use to the organization.

**2. Detailed Package Evaluation**

This is an important phase in the implementation of ERP system, since it determines whether the selected package results in the successful project or an unsuccessful project. Before purchasing the package, it is necessary to ensure that the purchased package alone can perform the required functionality. This is because if the selected package fails, then it is very difficult to switch to another process as it consumes both time as well as cost. While analyzing the package, the decision-making team should note that none of the packages are capable of fulfilling all the requirements of the company.

Therefore, the primary objective of selection process is not to search for the package that fulfill all the requirement of the company but to identify a package that is flexible for satisfying the requirements of the company.

**3. Project Planning Phase**

In this phase, the designs of implementation process is carried out by a committee consisting of team leaders. This committee is in turn supervised by ERP incharge who regularly review the planning process.

### 4. Gap Analysis

It is one of the important phase of ERP implementation. In this step, the company develops a model that determines the existing progress level of the company and also the level where the company is deciding to move in the future. In other words, it can be said that, the model developed helps in determining the functional gaps. While evaluating the ERP packages, it has been inferred that even the best ERP package is not capable of fulfilling all the functional requirements of the company.

### 5. Reengineering

This phase considers the human factors that effect the ERP implementation. Re-engineering have been used as a "downsizing" tool by the top management officials to reduce the number of employees working in the organization. They have made purchase of the ERP package as the basis of the cut-down in employee strength.

The implementation of the ERP system changes the business process and employee responsibilities and makes the process easy and efficient. Therefore, implementation of ERP system must be considered as an investment for growth of the business rather than a tool to reduce the number of employees. In addition to this, another perspective of reengineering in ERP field is Business Process Reengineering (BPR), which is an ERP implementation mode.

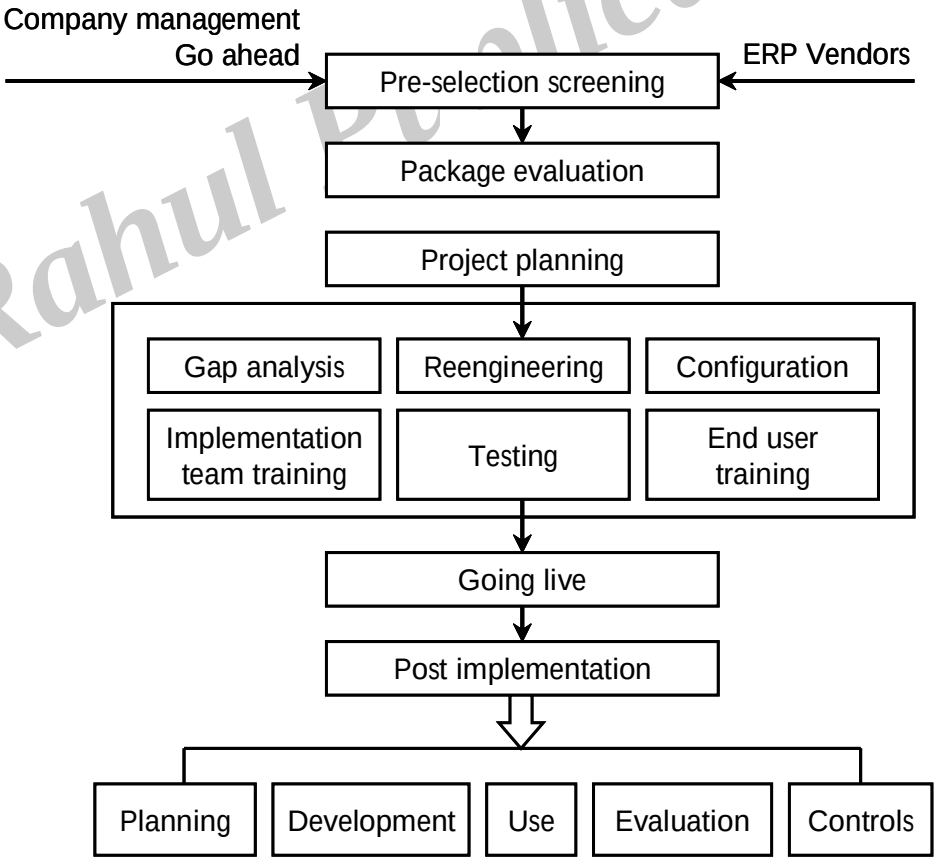



**Fig. : Stages of ERP**

**6. Customization**

It is one of the major functional area of ERP implementation process. As an ERP package is not perfect in satisfying all the requirements of a company, it is necessary to configure and customize the existing business process with regards to the ERP package.

This is done by completely understanding the business processes and then mapping these processes such that they matches with the overall objectives of the company. However, while performing the mapping activity it is necessary for the company to simultaneously perform their operations. This can be achieved by developing a prototype which generally is a simulation of the actual business process.

**7. Team Training**

When the customization phase is underway, the management starts training the employees regarding the way of implementing the system. The employees are trained to adapt to the change bought by the ERP system and to run the business process in a new and efficient way. The employees are selected based on their capabilities and knowledge i.e., employees who are enthusiastic, good learners and have the potential are trained to use the ERP system.

**8. Testing**

Testing is a phase where the capability of the implemented system is tested. The system is tested so as to determine what actions are carried out when,

(i) An invalid data is entered

(ii) Hacker tries to hack into the system

(iii) The system is overloaded

**9. Going-live**

It is a phase where the ERP system is practically implemented by all the members of the organization. From the technical perspective, all the required operations are performed including the data conversion. And from the functional perspective, the prototype is configured, tested and is used for performing the activities. The ERP system is considered operational even if the implementation team members are testing and executing it successfully only for certain period of time. Whenever, the new system is being implemented, then the existing system needs to be removed.

**10. End-user Training**

This phase is performed prior to going-live phase. In this phase, the end-users (i.e., the real users) who are going to use the ERP system and carryout the business activities are trained. Depending upon the capabilities, talent and skills, the employees are distributed among different groups and trained about the new system. This training helps the users to get used to the new system and understand their responsibilities regarding the new method of business process. This training is of high importance as the success and failure of the ERP system depends on the usage of the end-users.

Apart from this, the users are also trained about the task that they needs to perform after the ERP system goes live. However, because of the ignorance towards computers and technology, many people are scared to leave the traditional ways of business process. This makes it difficult for them to get adapted to new system and hence they become resistant towards the change. So, to overcome these situations, the top management of the company needs to take necessary measures such as interacting with the employees and building confidence in them.

End-user training is not only important but is also a complex process in contrast to the implementation team training. Hence, end-user training is taken up seriously and is given high priority by the organizations.

**11. Post Implementation Phase**

This phase deals with the operation and maintenance of the installed ERP system. After the implementation of the ERP system, the responsibilities of vendors and consultants are completed. Now, to achieve the benefits of ERP system it needs to be adapted by every individual employee of the organization. The employees or the users must be capable of handling any problem that may arise during the implementation of the new system. The company consists of technical expertise who have the ability of performing any improvements and enhancements within the system irrespective of the time.

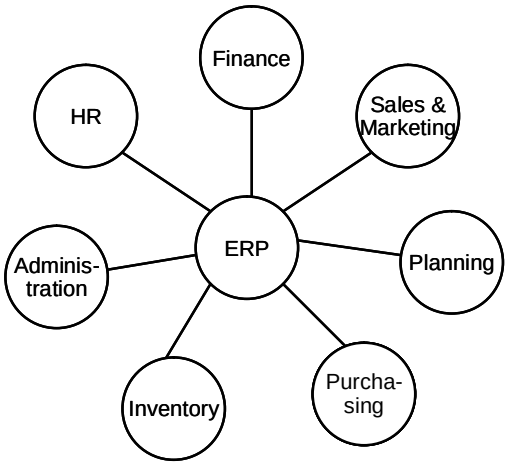
## Q13. What are the different ERP packages?

**(OR)**

**Explain the various modules of ERP.**

*Ans :* **(Imp.)**

In today's world Enterprise Resource Planning is termed as intelligent business solution that works to enhance productivity and increase profitability. The main purpose of ERP system is to interconnect different departments within an organization and improve flow of information. An ERP system consist several erp modules that work to improve different business processes which leads to overall increase in the efficiency of workforce. In simple language, an ERP module can be referred as a group of software programs that performs an important function in ERP software. Let's take a look at different ERP modules present in ERP software.




**(i) Administration module**

The admin module in the ERP looks over defining and assigning role to User's. in simple language, it tells who has to do what in the ERP system. It also controls and manages User's password policy. User session tracking, back-up, and database check are some of the functions and routine activities performed by Admin module.

**(ii) Finance module**

It is one of the important ERP modules. The finance ERP module collects financial data and generates reports such as quarterly financial statements, overall balance sheets, Profit and Loss A/c, Creditors balance, ledgers and several other financial reports. The finance ERP module is capable of taking care of all financial entries in the database and their effect on the system

**(iii) Sales and Marketing module**

The Sales ERP module manages different business processes such as order scheduling, order placement, order execution, invoicing, and shipping.

Some ERP software companies offer combined Sales and Marketing module in ERP system. A combined Sales and Marketing module also handles business processes such as direct mailing campaign, lead generation and several other important marketing and sales functions.

**(iv) Human Resources module**

The main function of ERP HR module is to maintain employee data such as contact information, attendance, salary details, performance evaluation and several other important employee details. The HR ERP module stores and manages all employee information from application to retirement. In some ERP software solutions, the HR ERP module is divided in four major sections that include Recruitment, Training, Attendance and Payroll functions.

**(v) Inventory module**

The primary function of ERP Inventory module is to maintain appropriate stock in a warehouse. The module recognizes inventory requirement, monitor item utilization, provide replenishment options, and report inventory status of all items in warehouse.

**(vi) Purchasing module**

The purchasing ERP module streamlines procurement of raw materials. Different processes such as recognizing potential suppliers, price negotiation, awarding purchase order and billing requires no human intervention. The Purchase module is strongly integrated with other modules such as production planning, inventory control to avoid over purchasing.

These are some of the functional ERP modules in a generic and customized ERP system. Nowadays, large and small businesses approach ERP Software Company to order customized ERP solutions. When you order a customized ERP solution for your business, the ERP software company developing the software studies different business processes within your organization and designs and develops an ERP system that streamlines flow of information and enhances efficiency of all employees. A customizer ERP system may contain ERP modules other than mentioned above.

**Q14. What are the methodologies in implementation of ERP?**

*Ans :*

To implement ERP systems, two popular approaches are used, which are known as Phased Implementation and Big- Bang Implementation. Let us try to understand these two approaches of ERP implementation.

**Big-Bang Implementation**

In a full big-bang implementation, an entire suite of ERP applications is implemented at all locations, at the same time. Using big bang, the system goes from being a test version to being the actual system used to capture transactions. This transformation takes place only in a matter of days and hence the name 'big bang'.

The big bang approach usually employs a three-step process. In the first step, virtually all relevant processes and artifacts are chosen (or developed) and implemented in the software. In the second step, all modules are tested individually and for their interfaces with other modules.

**Phased Implementation**

A phased approach is one where modules are implemented one at a time or in a group of modules, often a single location at a time. Phased implementations are sequential implementations that consist of designing, developing, testing and installing different modules.

**Q15. Explain some of the Emerging trends in ERP market.**

*Ans :* **(Imp.)**

Modem companies are putting an end to legacy systems and consolidating their fragmented IT environment. Moreover, small companies are also getting ready to implement integrated business systems. The AMR report gives the following trends of ERP market in the year 2004.

1. The use of Service-Oriented Architecture (SOA) in ERP packages is a major step towards new technology. The ERP market has already started this transition phase.
2. Big companies are acquiring small ERP firms. Recently, Oracle acquired 'Retek' even though it had already acquired PeopleSoft and JD Edwards. Moreover, small ERP vendors like Sage group, Epicor, SSA global etc., are actively participating in mergers and acquisitions and hence their market is rapidly increasing.
3. Now-a-days ERP customers do not purchasing large, up-front packages. Instead they are buying functional ERP modules incrementally. This paved way for discounting and smaller deals.

4. The vendors of ERP offers with large number of solutions related to enterprise application such as CRM and SCM. These applications are sold to present ERP customer base we observe that many specialized enterprise application vendors are taken over by large enterprise vendors as their survival becoming difficult.

**Q16. Explain the issues related to ERP maintenance and support.**

*Ans :*

**1. Managing Transitions**

The ongoing maintenance and support of ERP system is based upon how successful is the transition from implementation to support team. The management of ERP implementation and support is done by two different teams. In other words, the support team must acquire necessary knowledge transfer document handover and changes of open issues from implementation team.

As soon as the implementation team finishes its project, it leaves the site within weeks of 'Go Live'. After this, the new team acquires the site and manages the system. At this point, the support team faces the challenges in the inception because, there exist various issues.

**2. Managing Multiple Vendors**

The organization demands one or many individual vendors for support of the ERP such that one vendor for hardware support and other vendor for network support. This becomes a challenge as issues flow from one support to another.

**3. Managing Regular Upgrades**

Many ERP vendors consistently provide latest upgrades of their packages. Consequently, the ERP systems does not support the older versions of the packages. But, these systems needed to be updated even though the latest versions offers many new features which are of no use to the ERP vendors.

This updation can be expensive at time. As a consequence most of the companies perform only technical upgradation, this ascertains that the vendors are capable of supporting latest versions. The vendors treat every single upgrade as an individual project which consumes financial and different organizational resources.

**4. Getting Right People**

Getting the right people and making them do the same job regularly is a big challenge because highly qualified people show interest in new implementation rather than continuing in support role. As a consequence many organizations these days hire expertise IT organization to handover ERP maintenance job.

**5. Technology Obsolence**

The outdated technology or technology obsolence is said to be a biggest challenge in ERP systems. We observe that SaaS and cloud computing alters those models in which ERP solutions are established without the hardware and software investments. While the business requirements demands large developments previously, but now they are treated as a part of standard applications.

The SOA is new software development model whereas mobile collaborative applications are the necessity. Thus, organizations should manage technology obsolence and newly introduced technologies in an effective way.

**6. Managing Large Application Portfolios**

The ERP vendors introduces various applications for a particular business needs such as data warehousing applications reporting applications, supplier relationship management applications, customer relationship management applications and product life cycle management applications. Interestingly, such applications are obtained from multiple vendors such as ERP from SAP,

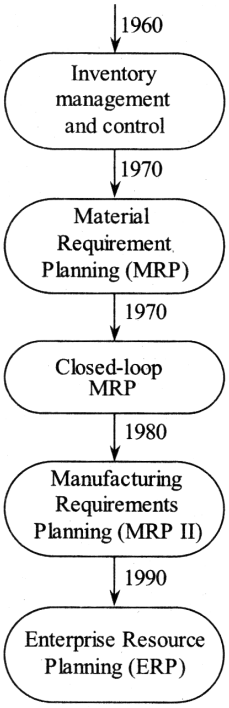
CRM from siebel and SRM from Ariba. Thus, management of these protfolio could be a challenging task for one or many vendors as they may have different support skills.

### 3.3.2 Evolution of ERP

**Q17. Discuss the Evolution of ERP.**

*Ans :*

Enterprise Resource Planning (ERP) is evolved in number of steps. The following figure shows the evolution of ERP.




**1. Inventory Management and Control**

Inventory management and control evolved in the year 1960. It combines the business processes and information technology to maintain the appropriate inventory stock level in a warehouse. The inventory management performs the activities that include determining the requirements for inventory, providing techniques and options for replenishment, setting targets, examining the usages of items, reporting the status of inventory and unifying the inventory balances.

**2. MRP**

In mid 1960's Bill of Materials (BOM) was the main stream. The growth in the BOM process resulted in MRP (Materials Requirement Planning). MRP has evolved in 1960's but it become popular in 1970s. It fulfilled the needs of manufacturing and production people mainly in ordering materials and components. To know the products that are going to be produced in the industry MRP makes use of Master Production Schedule (MPS). It gets the information about the required material from the BOM and stock related details from inventory records. With MRP manufacturing process became simple.

**3. Closed-loop MRP**

Apart from preparing material reordering schedules, MRP even records all the order due dates and reminds if an item failed to arrive on the due date. This will be useful in production process to reduce uncertainty. These capabilities resulted in the development of new tools and techniques for requirement planning, production schedules, sales planning, capacity planning, forecasting, production levels and atomizing processes across entire organization. These achievements finally, helped in the creation of closed loop MRP

Closed-loop MRP evolved in 1970, which included series of functions to automate production processes and supports planning and execution. It gives priorities to the processes and depending on these priorities it updates the planning functions.

**4. MRP II**

MRP II (Manufacturing Resource Planning) evolved after the closed-loop MRP. It includes some extra features like operational planning, financial interface and capabilities for decision-making. It includes functions related to execution support systems, capacity requirements planning, demand management, production planning, material requirement

planning, master scheduling, business planning, sales and operational planning. The results from the above functions is integrated based on the financial reports, shipping budget etc.

**5. ERP (Enterprise Resource Planning)**

ERP has evolved in 1990, the basics of ERP are similar to MRP II. It is an extension of MRP and includes the capabilities of MRP II.

To improve the level of performance of business processes ERP makes use of multi-module application software. It includes application modules for finance, accounting, human resources and marketing. They integrate 'business activities from different functional departments such as production planning, inventory control, order fulfillment, order tracking, purchasing and product distribution.

ERP is a collection of planning and scheduling tools, it connects suppliers, customers and provides foundation for effective supply-chain management and e-commerce. It coordinates sales, operations, logistics, marketing, finance, human resource, purchasing and product development. It focuses at productivity cost reduction, inventory turnover and customer services. ERP contains only one set of resource planning tools for entire enterprise.

### 3.3.3 Enterprise Systems in Large Organizations

**Q18. Explain various Enterprise Systems used in Large Organizations,**

*Ans :* **(Imp.)**

The following are the enterprise systems used in large organizations

**(i) Oracle NetSuite**

Managing enterprise resources by start-ups, family-owned businesses, small & mid-sized companies, and large enterprises.

Oracle NetSuite is an integrated resource planning software for different types of businesses in multiple sectors. The software can be used by manufacturing companies, finance companies, retail, and online companies.

The industry-specific software solution can help to streamline the business processes including CRM, accounting, order management, sales, HRM, and others.

NetSuite is the only cloud-only ERP solution for product and project-based companies. It combines complex resource planning functions with automation to optimize business functions including project management, accounting, resource management, and expense management.

**Features**

- Financial planning
- Order management
- Production management
- Supply chain management
- Procurement and warehouse management.

Oracle NetSuite offers advanced functions across different processes. The automation services are the key feature of the software that can result in streamlined operations and increased visibility of business processes.

**(ii) Salesforce**

Customer relationship management by small and mid-sized businesses and large organizations

Salesforce is a premium CRM software solution. The integrated customer management solution has components that can result in enhanced merchant experience and improved customer lifecycle management.

The ERP software features automated complaint resolution processes. It also has robust lead management features including lead assignment and routing, web-to-lead capture, campaign management, and email templates. There are also advanced modules for customer and sales management.

**Features**

- Integrated CRM platform
- AI and automation features.
- Scalable and flexible

Salesforce is not an integrated solution for managing different business functions. It is a dedicated CRM solution that can help in managing customer relationships and lead management.

**(iii) Basecamp**

Project management by small, medium-sized, and large companies.

Basecamp is another project management application that is suitable for all types of businesses. The online application is an all-in-one solution with storage, communication, and task scheduling features.

**Features**

- Real-time chat
- To-do list
- Schedules
- File storage

Basecamp is a powerful yet affordable project management application. The application is suitable for freelancers, startups, small and large-sized businesses.

**(iv) Stripe**

All types and sizes of businesses to accept and send payments.

Stripe is the best-rated online payment enterprise software. The online payment processing platform allows merchants to process payments collected from customers. They can also set up payments to suppliers using the online payment platform.

**Features**

- Embedded checkout
- PCI compliant
- Local and global payments
- Custom UI toolkit
- Real-time reports

Stripe is a must-have enterprise payment solution. The price of the merchant payment platform is affordable for most businesses. There are no monthly fees, setup fees, or any other hidden charges.

### 3.3.4 Benefits and Challenges of Enterprise Systems

**Q19. What are the Benefits and Challenges of ERP Systems?**

*Ans :* **(Imp.)**

**Benefits of ERP**

Enterprises can take advantage of several ERP benefits. First, focus on what your business expects to gain from the implementation of the ERP system. Typically, the main reason why businesses implement ERP systems is to increase productivity, improve reporting, and provide a single, integrated security model across business processes.

**1. Increase Productivity**

ERP systems typically improve productivity in several ways:

- Integrated systems typically improve communication between departments and business processes through data standardization and automated workflow processing.
- Everyone uses the same source of data, so reporting becomes more consistent, accurate, and timely.
- The various systems share a common data methodology, so the data is consistent across departments, business units, regions, and countries.

**2. Enhance Reporting**

Many ERP systems include an integrated reporting application. Using this reporting application, customers can quickly gain insight into data that may not have been previously

available. As you look at ERP systems, look at the reports that are provided with the software. Then, try to identify how you would use those reports to replicate or replace your existing reports.

**3. Improve Business Processes**

Many businesses view ERP implementation as an opportunity to review and improve core business processes. However, if you have ever been told that "We have always done it that way," you know that your business processes need improvement.

**Challanges**

1. ERP systems are very expensive to purchase and implement.
2. Extensive change is required to existing process.
3. It can be difficult to integrate the ERP systems with existing legacy systems.
4. There is an inherent risk associated with having a single vendor for all information systems.
5. The risk and impact of implementation failure is increased.
6. The conversion of data to the ERP systems from legacy systems is a complex process.

## 3.4 E-ENTERPRISE SYSTEM

**Q20. Define E-Enterprise System. State the characteristics of E-Enterprise System.**

*Ans :* **(Imp.)**

**Meaning**

Due to the technological enhancements, business managers are exploiting the features of Internet and other related sources to digitally carry out all the business related operations. These operations include data collection, validation, storage, delivery and decision-making. Due to this, the business (or) organizations adopting E-business approach is completely digitalizing their operations which are termed as digital firms or E-enterprises. In other words, a E-enterprise is a term given to the E-business enterprise that makes use of Internet and IT based concepts to carryout management processes including customer-supplier transactions, ERP (Enterprise Resource Planning) and CRM (Customer Relationship Management), SCM (Supply Chain Management).

**Characteristics**

The various characteristics of E-enterprise system are as follows,

1. It employs intensive use of technologies including content management, convergence and computing over the Internet to carryout business operations effectively.
2. Making the processes digital which provides increased flexibility, profitability and efficiency while avoiding people and paper based works.
3. All the transactions between customers, distributors and employees are carried out digitally in the form of digital pictures, animations, orders, receipts, bills etc., which helps in gaining strategic advantage to the firm and its stake holders.
4. Customers are allowed to browse through the web to get information regarding the product which is typically provided over a web portal. They can book order through it and track their order status.
5. Using digital firm concept, many of the operations such as data collection, analysis and some of the decision making processes can be automated which makes the process fast and accurate. Such functionality is helpful in real time systems where quick decision making is required.
6. It does not work on traditional 'command control' principle instead, it employs knowledge users which work collaboratively over a network in a virtual mode.

### 3.4.1 Managing the E-Enterprise

**Q21. Explain the concept of managing e-enterprise.**

*Ans :*

**Meaning**

The organizations have increased their scope of operation from traditional to latest trends of business. As the E-business technologies, the organizations adopt some of the trends inorder to operate their business from any geographical location. Also, the organization may provide its services 24 × 7 and 365 days to the users. The active participants like managers, vendors and customers can operate the business from anywhere. Because of effective communication in E-business, the products of an organization may reach to other countries.

Mostly, the E-business enterprise can be managed by using various electronic devices and digital technologies. These businesses are managed by using various softwares like ERP, CRM and SCM.

## 3.5 Organization of Business in an Enterprize

### 3.5.1 E-Business

**Q22. Define the term e-Business. What are the advantages and disadvantages of e-Business.**

**(OR)**

**Briefly explain about e-Business.**

*Ans :* **(Imp.)**

E-business (electronic business) is the conduct of business processes on the internet. These e-business processes include buying and selling goods and services, servicing customers, processing payments, managing production control, collaborating with business partners, sharing information, running automated employee services.

According to IBM "E-business is a secure, flexible and integrated approach to deliver differentiated business value by combining the systems and processes that run core business operations with the simplicity and reach made possible by Internet technology".

**(A) Advantages**

**1. Advantages for Sellers**

i) Increased sales opportunities

ii) Decreased costs

iii) 24 hours a day, 7 days a week sales

iv) Access to narrow market segments

v) Access to global markets

vi) Increased speed and accuracy of information delivery

vii) Data collection and customer preference tracking.

**2. Advantages for Buyers**

i) Wider product availability

ii) Customized and personalized information and buying options

iii) 24 hours a day, 7 days a week shopping

iv) Easy comparison shopping

v) Access to global markets

vi) Quick delivery of digital products and information

vii) Access to rich media describing products and services.

**(B) Disadvantages**

**1. Disadvantages for Sellers**

i) Growing competition from other e-business.

ii) Rapidly changing technologies

iii) Greater telecommunications capacity or bandwidth demands

iv) Difficulty of integrating existing business systems with e-business transactions

v) Problems inherent in maintaining e-business systems

vi) Global market issues: diverse languages, unknown political environments, and currency conversions.

**2. Disadvantages for Buyers**

i) Difficulty differentiating among so pay online sellers

ii) Unpredictable transaction security and privacy

iii) Dealing with unfamiliar, possibly, untrustworthy, sellers

iv) Inability to touch and feel products before buying them.

v) Unfamiliar buying processes and concerns about vendor reliability.

vi) Issues with state sales tax charges and logistical difficulties of product returns.

### 3.5.2 E-Commerce

**Q23. Define E-Commerce. Explain the categories and scope of E-Commerce.**

*Ans :*

**Meaning**

- Electronic commerce, commonly known as E-commerce is trading in products or services using computer networks, such as the Internet.
- Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems.
- Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle, although it may also use other technologies such as e-mail.
- Sharing business information, maintaining business relationships and conducting business transactions using computers connected to telecommunication network is called E-Commerce.
- Interactive marketing, ordering, payment, and customer support processes at E-commerce sites on the World Wide Web
- Extranet access of inventory databases by customers and suppliers
- Intranet access of customer relationship management systems by sales and customer service.
- Customer collaboration in product development via Internet newsgroups and E-mail exchanges.

**Categories**

**1. Electronic Markets**

Electronic Markets Present a range of offerings available in a market segment so that the purchaser can compare the prices of the offerings and make a purchase decision.

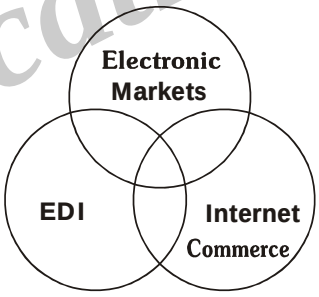



**Fig.: The three categories of e-commerce**

**2. Electronic Data Interchange (EDI)**

- It provides a standardized system
- Coding trade transactions
- Communicated from one computer to another without the need for printed orders and invoices & delays & errors in paper handling
- It is used by organizations that a make a large no. of regular transactions

**3. Internet Commerce**

- It is use to advertise & make sales of wide range of goods & services.
- This application is for both business to business & business to consumer transactions.

**Scope**

Companies involved in E-commerce as either buyers or sellers rely on Internet-based technologies and E-commerce applications and services to accomplish marketing, discovery, transaction processing, and product and customer service processes.

The Internet, Intranets, and Extranets provide vital electronic commerce links between the components of a business and its customers, suppliers, and other business partners.

**Q24. Explain the classification of E-Commerce.**

*Ans :*

**1. Business-to-Consumer (B2C) E-Commerce**

In this form of electronic commerce, businesses must develop attractive electronic marketplaces to entice and sell products and services to customers. Companies may offer:

- E-commerce websites that provide virtual storefronts and multimedia catalogs.
- Interactive order processing
- Secure electronic payment systems
- Online customer support

**2. Business-to-Business (B2B) E-Commerce**

This category of electronic commerce involves both electronic business marketplaces and direct market links between businesses. Companies may offer:

- Secure internet or Extranet E-commerce websites for their business customers and suppliers.
- Electronic data interchange (EDI) via the Internet or Extranets for computer-to-computer exchange of E-commerce documents with their larger business customers and suppliers.
- B2B E-commerce portals that provide auction and exchange markets for businesses.

**3. Consumer-to-Consumer (C2C) E-Commerce**

Successes of online auctions like e-Bay, allow consumers (and businesses) to buy and sell with each other in an auction process at an auction website.

- Online consumer or business auctions are an important E-commerce alternative for B2C or B2B E-commerce.
- Electronic personal advertising of products or services to buy or sell by consumers at electronic newspaper sites, consumer E-commerce portals, or personal websites is an important form of C2C E-commerce.

**Q25. State the Advantages & Limitations of E-Commerce.**

*Ans :*

**Advantages**

E-Commerce advantages can be broadly classified in three major categories.

1. Advantages to Organizations
2. Advantages to Consumers
3. Advantages to Society

**1. Advantages to Organizations**

- Using e-commerce, organizations can expand their market to national and international markets with minimum capital investment. An organization can easily locate more customers, best suppliers, and suitable business partners across the globe.
- E-commerce helps organizations to reduce the cost to create process, distribute, retrieve and manage the paper based information by digitizing the information.

- E-commerce improves the brand image of the company.
- E-commerce helps organization to provide better customer services.
- E-commerce helps to simplify the business processes and makes them faster and efficient.
- E-commerce reduces the paper work.
- E-commerce increases the productivity of organizations. It supports "pull" type supply management. In "pull" type supply management, a business process starts when a request comes from a customer and it uses just-in-time manufacturing way.

**2. Advantages to Customers**

- It provides 24x7 support. Customers can enquire about a product or service and place orders anytime, anywhere from any location.
- E-commerce application provides users with more options and quicker delivery of products.
- E-commerce application provides users with more options to compare and select the cheaper and better options.
- A customer can put review comments about a product and can see what others are buying, or see the review comments of other customers before making a final purchase.
- E-commerce provides options of virtual auctions.
- It provides readily available information. A customer can see the relevant detailed information within seconds, rather than waiting for days or weeks.
- E-Commerce increases the competition among organizations and as a result, organizations provides substantial discounts to customers.

**3. Advantages to Society**

- Customers need not travel to shop a product, thus less traffic on road and low air pollution.
- E-commerce helps in reducing the cost of products, so less affluent people can also afford the products.
- E-commerce has enabled rural areas to access services and products, which are otherwise not available to them.
- E-commerce helps the government to deliver public services such as healthcare, education, social services at a reduced cost and in an improved manner.

**Limitations**

**1. Security**

The biggest drawback of e-commerce is the issue of security. People fear to provide personal and financial information, even though several improvements have been made in relation to data encryption. Certain websites do not have capabilities to conduct authentic transactions. Fear of providing credit card information and risk of identity limit the growth of e-commerce.

**2. Lack of privacy**

Many websites do not have high encryption for secure online transaction or to protect online identity. Some websites illegally collect statistics on consumers without their permission. Lack of privacy discourages people to use internet for conducting commercial transactions.

**3. Tax issue**

Sales tax is another bigger issue when the buyer and seller are situated in different locations. Computation of sales tax poses problems when the buyer and seller are in different states. Another factor is that physical stores will lose business if web purchases are free from tax.

**4. Fear**

People fear to operate in a paperless and faceless electronic world. Some of the business organizations do not have physical existence, People do not know with whom they are conducting commercial transactions. This aspect makes people to opt physical stores for purchases.

**5. Product suitability**

People have to rely on electronic images to purchase products. Sometimes, when the products are delivered, the product may not match with electronic images. Finally, it may not suit the needs of the buyers. The lack of 'touch and feel' prevent people from online shopping.

**6. Cultural obstacles**

E-commerce attracts customers from all over the world. Habits and culture of the people differ from nation to nation. They also pose linguistic problems. Thus, differences in culture create obstacles to both the business and the consumers.

**7. High Labour cost**

Highly talented and technically qualified workforce are required to develop and manage the websites of the organization. Since internet provides a lot of job opportunities, business organizations have to incur a lot of expenses to retain a talented pool of employees,

**8. Legal issues**

The cyber laws that govern the e-commerce transactions are not very clear and vary from country to country. These legal issues prevent people from entering into electronic contracts.

**9. Technical limitations**

Some protocol is not standardized around the world. Certain software used by vendor to show electronic images may not be a common one. It may not be possible to browse through a particular page due to lack of standardized software. Insufficient telecommunication bandwidth may also pose technical problems.

**9. Huge technological cost**

It is difficult to merge electronic business with traditional business. Technological infra-structure may be expensive and huge cost has to be incurred to keep pace with ever changing technology. It is necessary to allocate more funds for technological advancement to remain competitive in the electronic world.

**Q26. What are the essential e-commerce processes required for successful operation of management.**

*Ans :* **(Imp.)**

**1. Access Control and Security**

E-commerce processes must establish mutual trust and secure access between the parties in an E-commerce transaction by authenticating users, authorizing access, and enforcing security features.

**2. Profiling and Personalization**

Profiling processes gather data on an individual and their website behavior and choices, and build electronic profiles of your characteristics and preferences. User profiles are developed using profiling tools such as user registration, cookie files, website behavior tracking software, and user feedback.

**3. Search Management**

Efficient and effective search processes provide a top E-commerce website capability that helps customers find the specific product or service they want to evaluate or buy.

**4. Content and Catalog Management**

Content management software helps E-commerce companies develop, generate, deliver, update, and archive text data, and multimedia information at E-commerce websites. E-commerce content frequently takes the form of multimedia catalogs of

product information. Generating and managing catalog content is a major subset of content management.

Content and catalog management may be expanded to include product configuration processes that support Web-based customer self service and the mass customization of a company's products. Configuration software helps online customers select the optimum feasible set of product features that can be included in a finished product.

**5. Workflow Management**

E-business workflow systems help employees electronically collaborate to accomplish structured work tasks within knowledge-based business processes. Workflow management in both E-business and E-commerce depends on a workflow software engine containing software models of the business processes to be accomplished.

The workflow model expresses the predefined sets of business rules, roles of stakeholders, authorization requirements, routing alternatives, databases used, and sequence of tasks required for each E-commerce process.

**6. Event Notification**

Most E-commerce applications are event-driven systems that respond to a multitude of events. Event notification processes play an important role in E-commerce systems, since customers, suppliers, employees, and other stakeholders must be notified of all events that might affect their status in a transaction.

**7. Collaboration and Trading**

This category of E-commerce processes are those that support the vital collaboration arrangements and trading services needed by customers, suppliers, and other stakeholders to accomplish E-commerce transactions.

**Q27. Explain the business applications of E-commerce in real world with suitable example.**

**OR**

**Explain the various application of E-commerce.**

*Ans :*

**1. Supply Chain Management**

Supply chain management is the process of procuring the raw materials and distributing the products to suppliers, distributors as well as consumers. It is the link between the partners who are involved in the supply and processing of goods. With this the manufacturers and the customers can obtain their raw materials and products respectively.

**2. Manufacturing e-Commerce**

It is also being applied in supply chain operations of a company. Some of the companies can form an electronic exchange by clubbing together the buying and selling of goods, trade market information, and run backoffice operations, such as inventory control.

This approach can speed up the flow of raw material and finished products among the members of the business community, and this will reduce the inventory that is required to be maintained by the company. However, this model has its own limitations, as there may be various issues relating to strategic and competitive issues. Many companies may not trust their competitors and may fear that they may lose trade secrets through participation in such electronic exchanges.

**3. Finance**

Nowadays a large number of e-Commerce applications are also found in the area of finance. Financial companies are applying e-Commerce in a big way. Online banking enabled the customers to check balances of

their saving and loan accounts, transfer money to other accounts, order for checkbooks, demand drafts online, pay their bill through eBanking. Online stock trading is another important application of e-Commerce in the financial stock. Many sites provide access to news, charts, company profiles, and analyst ratings on the stocks.

**4. Retail and Wholesale**

There are a large number of e-Commerce applications in retail and wholesale. e-Tailing, is a popular term, being used for online retailing. It is a direct sale from business to consumer through electronic storefronts, which are designed using electronic catalog and shopping cart model. There are numerous electronic retail websites, selling directly to the consumers.

Cybermall, another way to support e-tailing, is a single website that offers many products and services at one web location. An Internet cybermall attracts multiple buyers and sellers together into one virtual space through a web browser. Similarly, e-Commerce sites are used in wholesale buying and selling by different companies.

**5. Marketing**

Most of the companies are forced to change their marketing strategies due to various pressure on the business.

They obtain information from E-commerce about the customers requirement and preference certain enhancements can be done through this information. A good relationship can be build and maintained with the customers through e-commerce.

**Q28. Briefly discuss the various methods of online payments.**

*Ans :*

**1. Cards**

Online payment using cards can be divided into three types

(i) Credit cards

(ii) Debit cards

(iii) Charge cards

**(i) Credit cards**

If a customer purchased any product or service using credit card then he can simply transfer his card details to the service provider and then the credit-card company processes transaction.

**(ii) Debit cards**

In this type of retailing payment, the customer can pay in advance for enjoying the privileges of information to be retrieved. Examples for such prepaid payment system is electronic purse.

**(iii) Charge cards**

Charge-card is a way of getting a short-term loan for a purchase. It is similar to credit card, except that the customer makes an agreement with the financial institutions that he will pay some fixed charges to it each month. Example of charge-card payment includes American Express.

**2. Internet**

Online payments involve the customer transferring money or making a purchase online via the internet. Consumers and businesses can transfer money to third parties from the bank or other account, and hey can also use credit, debit and prepaid cards to make purchases online.

Current estimates are that over 80% of payments for online purchases are made using a credit card or debit card. At present, most online transactions involve payment with a credit card. While other forms of payment such as direct debits to accounts or prepaid accounts and cards are increasing, they currently represent a less developed transaction methodology.

### 3. Mobile Payments

Mobile phones are currently used for a limited number of electronic transactions. However, the percentage seems likely to increase as mobile phone manufacturers enable the chip and software in the phone for easier electronic commerce.

Consumers can use their mobile phone to pay for transactions in several ways. Consumers may send an SMS message, transmit a PIN number, use WAP to make online payments, or perform other segments of their transaction with the phone. As phones develop further, consumers are likely to be able to use infrared, Bluetooth and other means more frequently to transmit full account data in order to make payments securely and easily from their phone.

### 4. Biometric Payments

Electronic payments using biometrics are still largely in their infancy. Trials are underway in the United States, Australia and a limited number of other countries. Most biometric payments involve using fingerprints as the identification and access tool, though companies like Visa International are piloting voice recognition technology and retina scans are also under consideration. Essentially, a biometric identifier such as a fingerprint or voice could replace the plastic card and more securely identifies the person undertaking the transaction. The electronic payment is still charged to a credit card or other account, with the biometric identifier replacing the card, check or other transaction mechanism.

**Q29. Explain briefly about EDI.**

**(OR)**

**Define EDI.**

*Ans :*

Electronic data interchange (EDI) involves the electronic exchange of business transaction documents over the Internet and other networks between supply chain trading partners (organizations and their customers and suppliers). Data representing a variety of business transaction documents are electronically exchanged between computers using standard document message formats.

**Characteristics of EDI software include:**

- EDI software is used to convert a company's own document formats into standardized EDI formats as specified by various industry and international protocols.
- Formatted transaction data are transmitted over network links directly between computers, without paper documents or human intervention.
- Besides direct network links between the computers of trading partners, third-party services are widely used.
- EDI eliminates the printing, mailing, checking, and handling by employees of numerous multiple-copy forms of business documents.

**Benefits of the business use of EDI include:**

- Reduction in paper, postage, and labor costs
- Faster flow of transactions as formatted transaction data are transmitted over network links directly between computers, without paper documents or human intervention.
- Reductions in errors
- Increases in productivity Support
- Reductions in inventory levels
- Value-added network companies offer a variety of EDI services. They can offer secure, lower cost EDI services over the Internet.
- Smaller businesses can now afford the costs of EDI services.

### 3.5.3 E-Communication

**Q30. What is an electronic communication? Explain its types.**

*Ans :*

**Meaning**

Electronic communication can be defined as, the communication which uses electronic media to

transmit the information or message using computers, e-mail, telephone, video calling, FAX machine, etc. This type of communication can be developed by sharing data like images, graphics, sound, pictures, maps, software, and many things.

Because of this e-communication, there is a lot of changes have occurred in work areas, society, etc. Thus, people can simply access global communication with no physical movement. Please refer to this link to know about – Electronic Communication Protocols

**Types**

Electronic communication can be classified into different types like messaging, voice call, e-mail, social media, etc. We know that e-communication has changed due to the way public interact and communicate with each other for different purposes like personal or business. By using this, it is very simple to communicate with the world.

**1. E-Mail**

E-Mail or electronic mail is the most used type of electronic communication. By using this communication, one can send a message to another person through a mail immediately. For that, we need to create an account to send an e-mail, media files, photos, documents, etc. This type of communication has replaced many conventional types of communication due to many benefits.

**2. Messaging**

This type of communication allows people to interact with others who are far away from us. This is possible only due to technology as well as usage of the internet. There are different types of messengers are available like Skype, Windows Live, Gmail, etc. These messengers help in chatting or sending messages to our beloved ones or friends.

**3. Blogging**

At present, blogging is the most preferable communication method. This is a type of online journaling, which can be updated daily, or many times a day. It covers all the information or a particular topic.

**4. Video Chat**

This type of communication can be done by adding web cameras for video calling application. By using this application, one can communicate with others and also they can observe with whom they are speaking. The webcam can be connected to the computer externally and also we need to use applications like Skype, Hangouts, etc.

**5. Social Networking**

Social media is one kind of communication between people, which is used with their general advantage otherwise for relationships. In this, mostly Facebook, as well as LinkedIn, give places for people to work together, sometimes in real-time. There is a Micro-blogging service namely Twitter, which allows the short message of more than 140 characters to be transmitted to a huge audience.

**6. Fax**

The Fax machine is a kind of communications and use of this is increasing gradually to transmit materials which are visual like illustrations, diagrams, picture, etc. Here, this machine can be connected using a telephonic.

### 3.5.4 E-Collaboration

**Q31. Discuss in detail about E-Collaboration.**

*Ans :*

Collaboration is a process by which people work together on an intellectual, academic, or practical endeavour. In the past, that has meant in person, by letter, or on the telephone.

Electronic collaboration, on the other hand, connects individuals electronically via the Internet using tools such as email, or through access to sites on the World Wide Web. This Internet-based work allows collaborators to communicate anytime, from anywhere to any place. People from different parts

of a building, state, country, or continent can exchange information, collaborate on shared documents and ideas, study together, or reflect on their own practices.

Collaborating electronically can take many different forms. Some of the more common activities include the following:

- Discussion groups are focused around a topic or a specific activity, goal, or project. Some groups are open-ended and unmoderated, allowing users to solicit information from each other.

  Data collection and organization activities use databases and search engines to organize and retrieve data. Users contribute data individually to a shared database and retrieve data from it as needed. Data can be in the form of references (such as pointers to related work and Web sites), information (such as weather conditions or whale sightings), curriculum projects, research papers, and contact information for colleagues.

- Some projects involve sharing documents—from simply displaying them to having several people work on them simultaneously. Collaborators can display documents online and discuss the contents via email, videoconference, or chat. They can use annotation systems to comment on shared documents and editing tools to co-edit documents online.

- Synchronous communication activities such as Internet "chat" and videoconferencing—differ from the other types of activities in that they happen in real time, over a short period. In text based "chat" environments participants see what the other person is typing on the screen in real time. Videoconferencing is like a conference call with pictures. These technologies allow users to discuss ideas, debate problems, and share information electronically when face to-face interaction is desired but not possible.

- Teachers participate in online courses or workshops to learn something new. They are like traditional courses and workshops, but without face-to-face meetings. The electronic component allows people to participate whenever and from wherever they want. Such activities involve an instructor who distributes assignments, guides the conversation, and responds to participants.

# Short Question & Answers

**1. Data flow diagram.**

*Ans :*

A Data Flow Diagram (DFD) is a graphical representation normally designed by a system analyst and is used as a reference point by the programmer which portrays the "flow" of data through an information system. It is primarily used for the visualization of data processing for the structured design of an information system. It is common practice for a database designer to begin the process by drawing a context-level DFD, which shows the interaction between the system and outside entities. This context-level DFD is then "exploded" to show more detail of the system that is begin modeled.

- This is also called a bubble chart.
- It has four symbols: Square (defines sources), arrow (defines data flow), circle (defines process) and open rectangle (defines data store)
- It is the starting point in the system design that decomposes requirements to the lowest level of detail.
- It identifies major transformations that eventually become programs in system design.
- It consists of a series of bubbles joined by lines. Bubbles represent transformations and the lines represent the data flows in the system.

**2. What is structured analysis ?**

*Ans :*

Structured analysis is a structured methodology that is responsible for performing the following activities.

(i) Defining inputs, processes and outputs that are related to the system.

(ii) Developing a logical mode of the proposed system.

(iii) Partitioning the entire system into many manageable modules each of which defines different level of details.

(iv) Defining the processes or transformations to be performed on every individual modules.

(v) Defining the interfaces that exist between the modules.

**3. Data Dictionary.**

*Ans :*

It is a structured repository of data. Although we give descriptive names to the data flows, process and data stores in a DFD, it does not give the details. Hence to keep the details of the contents of data flows, process and data stores we also require a Data Dictionary. This is a structured repository of data. It clearly documents the list of contents of all data flows, processes and data stores.

The three classes to be defined are:

**1. Data Elements**

This the smallest unit of data. Further decomposition is not possible. The ISO-11179 Standards give rules for creating Data Element names.

**2. Data Structure**

It is a group of Data Elements which together form as a unit in a data structure.

**3. Data flows and Data stores**

Data flows are data structured in motion. Data Stores are data structures in store. (Data structures in a data store - a data store is a location where data structures are temporarily located).

**4. Decision trees**

*Ans :*

The decision tree is a tree-structure, where each non-leaf node represents the test on an attribute, branches represents the outcome of the test and the leaf nodes represents the class labels.

The decision tree shown in the above figure, enables the organization to identify the number of students who are going to join a software company. Some decision trees are binary and some trees are nonbinary.

Decision trees are mostly used for classification rules for tuples which don't have class label identifier for them. The class predictions can be made by traversing from root node to the leaf node.

**5. Decision Tables.**

*Ans :*

A decision table is a table of contingencies for defining a problem and the actions that need to be taken for it. It is a single representation of the relationships between conditions and actions, these pairs of condition sets and actions sets are known as rules. A condition is usually given a value of 'Y' for 'Yes, it is true", 'N' for 'No' and a dash for 'Do not care' in each rule. A decision tree fails to tell us what conditions to test. Where a decision table wins over a decision tree it that it can clearly call out the conditions that need to be tested. Whereas a decision tree fails to tell us what conditions to test, a decision table can clearly call out the conditions to test. Another advantage is that a decision table can be used to generate code in a procedural application language which is optimized for performance based on the expected likelihood of a rule being valid in the data.

**6. CASE**

*Ans :*

Computer-aided software engineering (CASE)—sometimes called 'computer-aided systems engineering—provides software tools to automate the methodologies we have just described to reduce the amount of repetitive work the developer needs to do. CASE tools also facilitate the creation of clear documentation and the coordination of team development efforts. Team members can share their work easily by accessing each other's files to review or modify what has been done. Modest productivity benefits can also be achieved if the tools are used properly.

CASE tools provide automated graphics facilities for producing charts and diagrams, screen and report generators, data dictionaries, extensive reporting facilities, analysis and checking tools, code generators, and documentation generators. In general, CASE tools try to increase productivity and quality by:

- Enforcing a standard development methodology and design discipline.
- Improving communication between users and technical specialists.
- Organizing and correlating design components and providing rapid access to them using a design repository.
- Automating tedious and error-prone portions of analysis and design.
- Automating code generation and testing and control roll out.

**7. Outsourcing**

*Ans :*

Outsourcing refers to the process where one organization purchases materials, parts or services from other organization instead of building those materials in-house or performing those services by themselves. Ideally, the functions which are outsourced are considered as non-core to the business.

**For example,** an automobile company does not posses skills, resources and assets that are required to develop a software for themselves. Therefore, the automobile firm may outsource the job of developing a software to a software development firm. This will be the best way for the firm as it saves time and will be less expensive than developing the software in-house.

**8. What are the advantages and disadvantages of CASE Tools ?**

*Ans :*

**Advantages**

1. Produce system with a longer effective operational life.
2. Produces system that more closely meet user needs and requirements.
3. Produces system with excellent documentation.
4. Produces system that needs less systems support.
5. Produce more flexible system.

**Disadvantages**

1. Produce initial system that is more expensive to build and maintain.
2. Require more extensive and accurate definitions of user needs and requirements.
3. May be difficult to customize.
4. Require training of maintenance staff.
5. May be difficult to use with existing system.

**9. ERP ?**

*Ans :*

Enterprise Resource Planning (ERP) System may be defined as a highly integrated information system, which provides information for all the functional areas as well as at all the management levels of an organization. It may be understood as a computer based system designed to process an organization's transactions and to integrate the various functions/departments/divisions within an organization. Thus, ERP System is a set of application software/package that provides operational, managerial, and strategic information for an enterprise.

Since the ERP system is an enterprise-wide framework that includes the various functional areas like Sales and Marketing; Production and Inventory Management; Accounts and Finance, Human Resources, etc., it is regarded as the business backbone of an organization.

**10. MRP.**

*Ans :*

In mid 1960's Bill of Materials (BOM) was the main stream. The growth in the BOM process resulted in MRP (Materials Requirement Planning). MRP has evolved in 1960's but it become popular in 1970s. It fulfilled the needs of manufacturing and production people mainly in ordering materials and components. To know the products that are going to be produced in the industry MRP makes use of Master Production Schedule (MPS). It gets the information about the required material from the BOM and stock related details from inventory records. With MRP manufacturing process became simple.

**11. Benefits of ERP**

*Ans :*

**1. Increase Productivity**

ERP systems typically improve productivity in several ways:

- Integrated systems typically improve communication between departments and business processes through data standardization and automated workflow processing.
- Everyone uses the same source of data, so reporting becomes more consistent, accurate, and timely.
- The various systems share a common data methodology, so the data is consistent across departments, business units, regions, and countries.

**2. Enhance Reporting**

Many ERP systems include an integrated reporting application. Using this reporting application, customers can quickly gain insight into data that may not have been previously available. As you look at ERP systems, look at the reports that are provided with the software. Then, try to identify how you would use those reports to replicate or replace your existing reports.

**3. Improve Business Processes**

Many businesses view ERP implementation as an opportunity to review and improve core business processes. However, if you have ever been told that "We have always done it that way," you know that your business processes need improvement.

**12. Define E-Enterprise System.**

*Ans :*

**Meaning**

Due to the technological enhancements, business managers are exploiting the features of Internet and other related sources to digitally carry out all the business related operations. These operations include data collection, validation, storage, delivery and decision-making. Due to this, the business (or) organizations adopting E-business approach is completely digitalizing their operations which are termed as digital firms or E-enterprises. In other words, a E-enterprise is a term given to the E-business enterprise that makes use of Internet and IT based concepts to carryout management processes including customer-supplier transactions, ERP (Enterprise Resource Planning) and CRM (Customer Relationship Management), SCM (Supply Chain Management).

**13. Managing e-enterprise.**

*Ans :*

The organizations have increased their scope of operation from traditional to latest trends of business. As the E-business technologies, the organizations adopt some of the trends inorder to operate their business from any geographical location. Also, the organization may provide its services 24 × 7 and 365 days to the users. The active participants like managers, vendors and customers can operate the business from anywhere. Because of effective communication in E-business, the products of an organization may reach to other countries.

Mostly, the E-business enterprise can be managed by using various electronic devices and digital technologies. These businesses are managed by using various softwares like ERP, CRM and SCM.

**14. e-Business.**

*Ans :*

E-business (electronic business) is the conduct of business processes on the internet. These e-business processes include buying and selling goods and services, servicing customers, processing payments, managing production control, collaborating with business partners, sharing information, running automated employee services.

According to IBM "E-business is a secure, flexible and integrated approach to deliver differentiated business value by combining the systems and processes that run core business operations with the simplicity and reach made possible by Internet technology".

**15. Define E-Commerce.**

*Ans :*

**Meaning**

- Electronic commerce, commonly known as E-commerce is trading in products or services using computer networks, such as the Internet.

- Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems.
- Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle, although it may also use other technologies such as e-mail.
- Sharing business information, maintaining business relationships and conducting business transactions using computers connected to telecommunication network is called E-Commerce.
- Interactive marketing, ordering, payment, and customer support processes at E-commerce sites on the World Wide Web
- Extranet access of inventory databases by customers and suppliers
- Intranet access of customer relationship management systems by sales and customer service.
- Customer collaboration in product development via Internet newsgroups and E-mail exchanges.

**16. Explain the classification of E-Commerce.**

*Ans :*

**1. Business-to-Consumer (B2C) E-Commerce**

In this form of electronic commerce, businesses must develop attractive electronic marketplaces to entice and sell products and services to customers. Companies may offer:

- E-commerce websites that provide virtual storefronts and multimedia catalogs.
- Interactive order processing
- Secure electronic payment systems
- Online customer support

**2. Business-to-Business (B2B) E-Commerce**

This category of electronic commerce involves both electronic business marketplaces and direct market links between businesses. Companies may offer:

- Secure internet or Extranet E-commerce websites for their business customers and suppliers.
- Electronic data interchange (EDI) via the Internet or Extranets for computer-to-computer exchange of E-commerce documents with their larger business customers and suppliers.
- B2B E-commerce portals that provide auction and exchange markets for businesses.

**3. Consumer-to-Consumer (C2C) E-Commerce**

Successes of online auctions like e-Bay, allow consumers (and businesses) to buy and sell with each other in an auction process at an auction website.

- Online consumer or business auctions are an important E-commerce alter-native for B2C or B2B E-commerce.
- Electronic personal advertising of products or services to buy or sell by consumers at electronic newspaper sites, consumer E-commerce portals, or personal websites is an important form of C2C E-commerce.

**17. Define EDI.**

*Ans :*

Electronic data interchange (EDI) involves the electronic exchange of business transaction documents over the Internet and other networks between supply chain trading partners (organizations and their customers and suppliers). Data representing a variety of business transaction documents are electronically exchanged between computers using standard document message formats.

**18. E-Communication**

*Ans :*

Electronic communication can be defined as, the communication which uses electronic media to transmit the information or message using computers, e-mail, telephone, video calling, FAX machine, etc. This type of communication can be developed by sharing data like images, graphics, sound, pictures, maps, software, and many things.

Because of this e-communication, there is a lot of changes have occurred in work areas, society, etc. Thus, people can simply access global communication with no physical movement. Please refer to this link to know about – Electronic Communication Protocols.

**19. E-Collaboration.**

*Ans :*

Collaboration is a process by which people work together on an intellectual, academic, or practical endeavour. In the past, that has meant in person, by letter, or on the telephone.

Electronic collaboration, on the other hand, connects individuals electronically via the Internet using tools such as email, or through access to sites on the World Wide Web. This Internet-based work allows collaborators to communicate anytime, from anywhere to any place. People from different parts of a building, state, country, or continent can exchange information, collaborate on shared documents and ideas, study together, or reflect on their own practices.

Collaborating electronically can take many different forms. Some of the more common activities include the following:

- Discussion groups are focused around a topic or a specific activity, goal, or project. Some groups are open-ended and unmoderated, allowing users to solicit information from each other.

  Data collection and organization activities use databases and search engines to organize and retrieve data. Users contribute data individually to a shared database and retrieve data from it as needed. Data can be in the form of references (such as pointers to related work and Web sites), information (such as weather conditions or whale sightings), curriculum projects, research papers, and contact information for colleagues.

- Some projects involve sharing documents from simply displaying them to having several people work on them simultaneously. Collaborators can display documents online and discuss the contents via email, videoconference, or chat. They can use annotation systems to comment on shared documents and editing tools to co-edit documents online.

**20. Structured Methodologies.**

*Ans :*

Structured methodologies have been used to document, analyze, and design information systems since the 1970s. Structured refers to the fact that the techniques are step by step, with each step building on the previous one. Structured methodologies are top-down, progressing from the highest,' most abstract level to the lowest level of detail from the general to the specific.

Structured development methods are process-oriented, focusing primarily on modeling the processes, or actions that capture, store, manipulate, and distribute data as the data flow through a system. These methods separate data from processes. A separate programming procedure must be written every time someone wants to take an action on a particular piece of data. The procedures act on data that the program passes to them.

**21. Object-oriented Development**

*Ans :*

Object-oriented development addresses these issues. Object-oriented development uses the object as the basic unit of systems analysis and design. An object combines data and the specific processes that operate on those data. Data encapsulated in an object can be accessed and modified only by the operations, or methods, associated with that object. Instead of passing data to procedures, programs send a message for an object to perform an operation that is already embedded in it. The system is modeled as a collection of objects and the relationships among them. Because processing logic resides within objects rather that in separate software programs, objects must collaborate with each other to make the system work.

# Choose the Correct Answers

1. ERP supports _____ currency value. [ a ]
   (a) Multiple (b) Single
   (c) Three (c) Five
2. ERP package will handle _____ business functionalities. [ d ]
   (a) One (b) Two
   (c) Three (d) All
3. The most important step of ERP implementation is _____ phase. [ c ]
   (a) Installing (b) Training
   (c) Gap analysis (d) Testing
4. An enterprise is a group of people with _____. [ a ]
   (a) Common goal (b) Separate goal for each department
   (c) Multiple goals (d) Two or more goals
5. In _____ entire organization is considered as a system and the departments are its subsystem. [ c ]
   (a) Business way (b) General
   (c) Enterprise way (d) Planning
6. Material Requirement Planning(MRP) utilizes software applications for scheduling _____. [ b ]
   (a) Sales management (b) Production processes
   (c) Marketing techniques (d) Human resource management
7. Following is not an advantage of B2C. [ d ]
   (a) Direct communication (b) Business Expansion
   (c) Chiper than Normal Business (d) Limited Market
8. E- Marketing is also known as [ c ]
   (a) Online -Advertising (b) Internet - Marketing
   (c) a & b (d) None
9. Which is not an video Add. [ d ]
   (a) AOL (b) Tubmate
   (c) Facebook (d) Text message
10. Find which is not related with E-Banking? [ d ]
    (a) Debit card (b) Credit card
    (c) Smart card (d) LISENCE - card

# Fill in the blanks

1. _____ methodologies have been used to document, analyze, and design information systems since the 1970s.
2. DFD _____
3. The _____ symbol represents an activity that transforms or manipulates the data.
4. _____ tools contain features for validating design diagrams and specifications.
5. _____ consists of building an experimental system rapidly and inexpen- sively for end users to evaluate.
6. _____ System may be defined as a highly integrated information system, which provides information for all the functional areas as well as at all the management levels of an organization.
7. _____ Systems serves as a cross-functional enterprise backbone that integrates all the processes of the business and help plan the resources of the organization.
8. _____ is a phase where the capability of the implemented system is tested.
9. MRP stands for _____.
10. ERP is a _____ process.

**ANSWESRS**

1. Structured
2. Data Flow Diagram
3. Process
4. CASE
5. Prototyping
6. Enterprise Resource Planning
7. ERP
8. Testing
9. Materials Requirement Planning
10. Time-consuming

# One Mark Answers

**1. Data Store.**

*Ans :*

Data Stores are repository for data that are temporarily or permanently recorded within the system.

**2. Data Flow.**

*Ans :*

The Data Flow symbol represents movement of data.

**3. Data Structure.**

*Ans :*

It is a group of Data Elements which together form as a unit in a data structure.

**4. Expand CASE.**

*Ans :*

Computer-aided systems engineering.

**5. Prototyping.**

*Ans :*

Prototyping consists of building an experimental system rapidly and inexpen- sively for end users to evaluate.

**6. Expand ERP.**

*Ans :*

Enterprise Resource Planning

UNIT IV

**ADVANCED MIS:**

Concepts, Needs and Problems in Achieving Advanced MIS, DSS., Business intelligence + process management, systems development, and security.

## 4.1 ADVANCED MIS

### 4.1.1 Concepts, Needs and Problems in Achieving Advanced MIS

**Q1. What is meant by advanced MIS ?**

*Ans :*

The advanced information systems that help in managing business organizations are referred to as advanced Management Information Systems (MIS). Examples of advanced MIS are Expert Systems and Knowledge Management Systems.

#### 4.1.1.1 Supply Chain Management

**Q2. What is supply chain management?**

*Ans :*

Supply chain management (SCM) is a management concept that integrates the management of supply chain processes. Many companies are making SCM a top strategic objective of their E-business initiatives. It is an absolute requirement if they want to meet their E-commerce customer value imperative. Companies are reengineering their supply chain processes through the aid of Internet technologies and supply chain management software.

**Definitions**

**(i) According to Jones and Riley,** "Supply chain management deals with the total flow of material from supplier through end user".

**(ii) According to Cooper and Ellram,** "Supply chain management is an integrative philosophy to manage the total flow of distribution channel front the supplier to the ultimate user".

**(iii) According to Marty Weil,** "Supply chain management is the ability to get closer to the customer".

**(iv) According to Professor Douglas M. Lambert,** "Supply chain management as the integration of business process from the end user through original suppliers who provide products, services, and information that adds value for the customer".

The goal of supply chain management is to:

- Give customer what they want
- Give customers what they want, and where they wants it
- Give customers what they want, where they want it, and at the lowest possible cost.

**Q3. Elucidate the Evolution of supply chain management?**

*Ans :*

**1. Creation Era**

The term supply chain management was first coined by a U.S. industry consultant in the early 1980s. However, the concept of a supply chain in management was of great importance long before, in the early 20th century, especially with the creation of the assembly line. The characteristics of this era of supply chain management include the need for large-

scale changes, re-engineering, downsizing driven by cost reduction programs, and widespread attention to the Japanese practice of management.

**2. Integration Era**

This era of supply chain management studies was highlighted with the development of Electronic Data Interchange (EDI) systems and developed through the introduction of Enterprise Resource Planning (ERP) systems. This era has continued to develop into the 21st century with the expansion of internet-based collaborative systems. This era of supply chain evolution is characterized by both increasing value-adding and cost reductions through integration.

**3. Globalization Era**

The third movement of supply chain management development, the globalization era, can be characterized by the attention given to global systems of supplier relationships and the expansion of supply chains over national boundaries and into other continents. Although the use of global sources in the supply chain of organizations can be traced back several decades (e.g., in the oil industry), it was not until the late 1980s that a considerable number of organizations started to integrate global sources into their core business. This era is characterized by the globalization of supply chain management in organizations with the goal of increasing their competitive advantage, value-adding, and reducing costs through global sourcing.

**4. Specialization Era—Phase One: Outsourced Manufacturing and Distribution**

Companies abandoned vertical integration, sold off non-core operations, and outsourced those functions to other companies. This changed management requirements by extending the supply chain well beyond company walls and distributing management across specialized supply chain partnerships.

This transition also re-focused the fundamental perspectives of each respective organization. An Original Equipment Manufacturer (OEM) became brand owners that needed deep visibility into their supply base. They had to control the entire supply chain from above instead of from within. Contract manufacturers had to manage bills of material with different part numbering schemes from multiple OEMs and support customer requests for work -in-process visibility and vendor-managed inventory (VMI).

The specialization model creates manufacturing and distribution networks composed of multiple, individual supply chains specific to products, suppliers, and customers, who work together to design, manufacture, distribute, market, sell, and service a product. The set of partners may change according to a given market, region, or channel, resulting in a proliferation of trading partner environments, each with its own unique characteristics and demands.

**5. Specialization Era—Phase Two: Supply Chain Management as a Service**

Specialization within the supply chain began with the inception of transportation brokerages, warehouse management, and non-asset-based carriers and has matured beyond transportation and logistics into aspects of supply planning, collaboration, execution and performance management.

At any given moment, market forces could demand changes from suppliers, logistics providers, locations and customers, and from any number of these specialized participants as components of supply chain networks. This variability has significant effects on the supply chain infrastructure, from the foundation layers of establishing and managing the electronic communication between the trading partners to more complex requirements including the configuration of the processes and work flows that are essential to the management of the network itself.

**6. Supply Chain Management 2.0 (SCM 2.0)**

Building on globalization and specialization, the term SCM 2.0 has been coined to describe both the changes within the supply chain itself as well as the evolution of the processes, methods and tools that manage it in this new "era".

Web 2.0 is defined as a trend in the use of the World Wide Web that is meant to increase creativity, information sharing, and collaboration among users. At its core, the common attribute that Web 2.0 brings is to help navigate the vast amount of information available on the Web in order to find what is being sought. It is the notion of a usable pathway. SCM 2.0 follows this notion into supply chain operations. It is the pathway to SCM results, a combination of the processes, methodologies, tools and delivery options to guide companies to their results quickly as the complexity and speed of the supply chain increase due to the effects of global competition, rapid price fluctuations, surging oil prices, short product life cycles, expanded specialization, near-/far- and off-shoring, and talent scarcity.

**Q4. What are the objectives of Supply chain management ?**

*Ans :*

The objectives of supply chain integration are to supply superior quality goods faster, with efficient processes and in essence be more responsive to the perceptions of the marketplace and be able to change directions at will. Some of the consequences of supply chain integration result in.

**1. Supply chain planning**

Planning sets directions for the enterprise

**2. Procurement**

Establishing what needs to be purchased, selecting suppliers & managing relations with them, reducing costs, improving possibly raw material.

**3. Inventory management**

Managing levels of inventory in order to satisfy internal and external customers demand.

**4. Packaging**

Ensuring correct package design in order to encourage the recycling of packaging and reducing packages costs.

**5. Facility design**

This includes insuring the best design that suits the internal or external customers. Here we are concerned with the issue such as : Size, Lightning, facilities, equipment , safety and security.

**6. Warehousing**

This includes stock management, efficient facility operations, layouts for effective transportation, safety, storage methods and equipment.

**7. Transportation**

This includes transportation modes, costs, transportation management, terminal utilization, and in-transit care of goods.

**8. Reverse logistics**

The reduction where possible of product errors so that reverse logistics may be reduced.

**9. Logistics Systems**

This includes decision support systems, technology and software

**10. Customer service and marketing**

This includes customer relationships, customer solicitation and retention and issues pertaining to the marketing mix variables.

**Q5. State the functions of Supply chain management.**

*Ans :* **(Imp.)**

**1. Minimizing Uncertainty**

Supply uncertainty due to unreliability of vendors, process planning information and

joint attention to transport arrangements. Process uncertainty is due to machine breakdowns, uncertain yields and absenteeism, which can be addressed through good maintenance practices, better technology, etc. Demand uncertainty can be reduced to some extent by forecasting techniques and by better communication with customers.

**2. Reducing Lead Times**

Lead times at the stages of procurement, conversion and distribution can be cut down by faster modes of transport, better planning practices and process technologies.

**3. Minimizing the Number of Stages**

In general, the number of stages that goods and services flow through adds to the complexity of SCM. Unification of tasks and reducing the number of stages make the coordination of decisions easier. This is the essence of another management concept, namely Business Process Re-engineering.

**4. Improving Flexibility**

Reducing set - up or change overtimes in various processes and the use of flexible manufacturing and assembly techniques improves the flexibility of response. In transport, the use of smaller vehicles provides flexibility in making dispatches at short notice without being constrained by batching economies. As an extended principle, wherever possible, batch processes should be made continuous processes.

**5. Improving Process Quality**

A prerequisite to effective SCM in the light of reducing inventories and wastage is to do things right, the first time. This is deal for improving process quality. The techniques for this include statistical process control, root cause analysis of poor quality and improvement of process capability.

**6. Minimizing Variety**

Variety is one of the major causes for inventory in the downstream part of supply chains. One response appropriate promotion and branding. This will enable a better control of the supply chain, right from demand generation.

**7. Delaying Differentiation**

The value addition through product differentiation should be postponed as far as possible, so that precise customer needs can be met without holding committed stocks in the entire chain. There are numerous examples of how this can be done, such as shipping of component level goods to major points and assembling according to customer needs, postponing, finishing operations like grinding and mixing of additives to cement till near the final point of consumption, etc.

**8. Kitting of Supplies**

In assembly systems, a major source of delay is the staging delay where some components for assembly have to wait since matching components are not available. Vendors or internal facilities that supply components can be arranged so that all components required for an assembly (or major sub assembly) are manufactured or supplied to one stage where they are kitted into sets of matching components, ready for assembly and further operations. This could involve some restructuring of vendors or internal activities and some vertical integration.

**9. Focusing on 'A' Category**

This is a well – known idea from classical economies and inventory theory, where items that account for a large part of the value, or which are critical, and / or customers who are significant, and / or territories that are important, receive special attention.

**10. Planning for Multiple Supply Chains**

doing better SCM would often require different supply chains for different customer segments based on response requirements. The tendency to club supply chains in the interest of efficiency can be counter – productive for effectiveness.

**11. Modifying Performance Measures**

These need to move from being single – actor focused to multi – actor focused in the supply chain. For example, in the context of a warehouse, instead of warehouse space utilization as the primary measure of warehouse performance the retrieval time would be more in tune with SCM, since this focuses on both the warehouse and the downstream actor. Similarly, a transporter like the railways would focus more on time taken for delivering a wagon / rake to a customer from the time the indent is placed, rather than wagon utilization / turnaround.

**12. Competing on Service**

The big opportunity in SCM for long – term competitive advantage is on the service aspects of value delivery to the customer. Product quality and features can only be short – term advantages.

**13. Moving from Functions to Processes**

Improving supply chain practices will require integrated process orientation rather than functional organization. Job rotation, flatter and lean organizations will help.

**14. Taking Initiatives at an Industry Level**

This is very essential, especially in dealing with poor infrastructure. Industry – level (rather than firm - level) initiatives in specific product categories can focus on say transport and / or warehousing inadequacies and help to develop appropriate service providers. There is a big opportunity for third party logistics services here.

### 4.1.1.2 Knowledge Management System

**Q6. What is Knowledge Management System? Explain briefly.**

**OR**

**What is Knowledge Management?**

*Ans :*

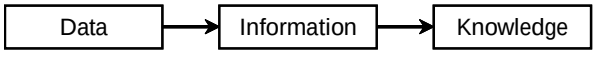
**Meaning**

Knowledge Management System (KM System) refers to a (generally IT based) system for managing knowledge in organizations for supporting creation, capture, storage and dissemination of information. It can comprise a part (neither necessary nor sufficient) of a Knowledge Management initiative.

The idea of a KM system is to enable employees to have ready access to the organization's documented base of facts, sources of information, and solutions. For example a typical claim justifying the creation of a KM system might run something like this: an engineer could know the metallurgical composition of an alloy that reduces sound in gear systems. Sharing this information organization wide can lead to more effective engine design and it could also lead to ideas for new or improved equipment.

The term KMS can be associated to Open Source Software, and Open Standards, Open Protocols and Open Knowledge licenses, initiatives and policies.

**Knowledge hierarchy**




**Components**

The basic components of the model are

1 **A knowledge asset :** knowledge assets often contain the context behind the activity, recommendations for how to do the activity in future.

2. **Learning before :** knowledge is assessed at the start of the project or a piece of work, to ensure that you start the work with a full knowledge base.

3. **Learning after :** after completion of a project cycle, the knowledge is collected from all those who took part and collated for future use.

4. **Accountable knowledge roles:** they are represented by the face with in the business activity cycle at the bottom of the model picture.

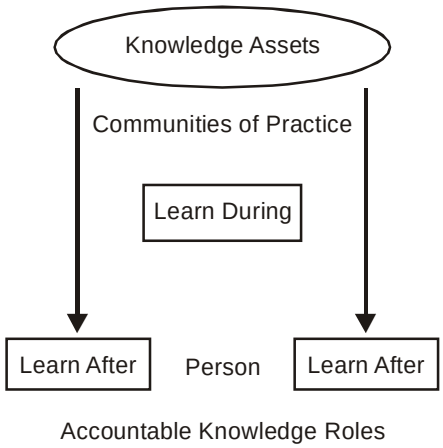



**Fig.: Knowledge Management Model**

### 4.1.1.3 Customer Relationship Management

**Q7. What is Customer Relationship Management?**

**(OR)**

**Explain about customer relationship management.**

*Ans :* **(Imp.)**

**Meaning**

The concept of customer relationship management as a cooperative and collaborative process has tended to be more common. Its purpose is mutual value creation on the part of the marketer and customer.

**Definition**

**According to white whale,** customer relationship management which is sometimes referred to as relationship or marketing or one to one marketing is defined by as: the integration is a process, culture and systems to recognize, differentiate, service and develop an organisations most valuable customers.

**Processes in CRM**

The key processes under CRM are as follows:

- **Marketing:** This process involves decision regarding which customers to target, how to target customers, and what products to offer, how to price products and how to manage the actual campaigns targeting customers.
- **Sell:** It focus on making an actual sale to a customer. The sell process includes providing the sale force the information they need to make a sale and then executing the actual sale.
- **Order management:** The process of managing customer orders as they flow through an enterprise is important for the customer to track his order and for the enterprise to plan and executives order fulfilment.
- **Call/services center:** It is often the primary point of contact between a company and its customer. Is center helps customer place orders, suggest products, solves problems, and provides information on order status.

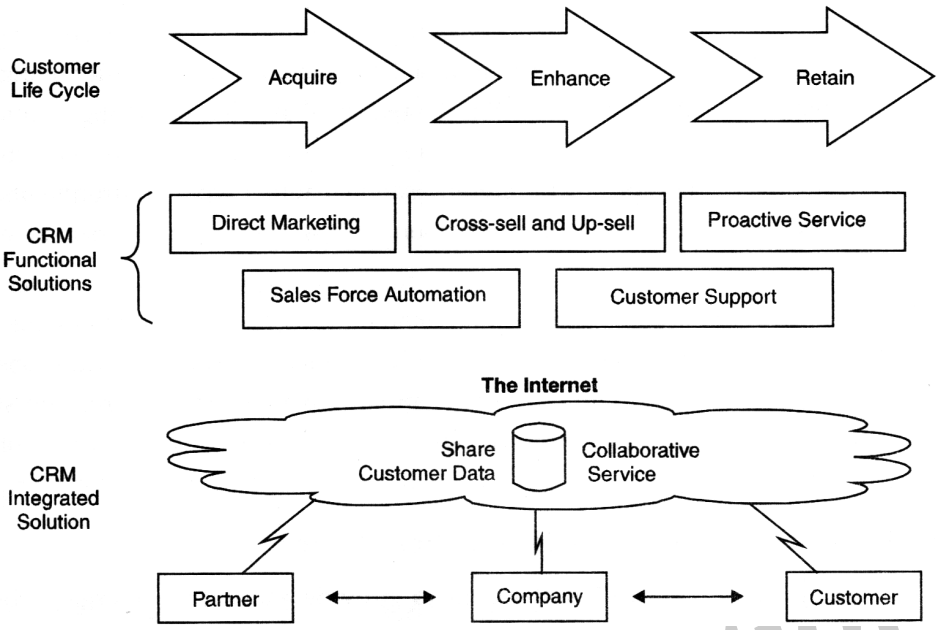
**Q8. Explain the different phases of Customer Relationship Management.**

*Ans :* **(Imp.)**

The three phases of CRM are :

**(i) Acquire**

A business relies on CRM systems, which helps to acquire new customers by doing a superior job of contract management, sales prospecting, selling, direct marketing, and fulfillment. The goal of these CRM functions is to help customers perceive the value of a superior product offered by an outstanding company.




### (ii) Enhance

Web-enabled CRM account management and customer service and support tools helps to keep customers happy by supporting superior service from a responsive networked team of sales and service specialists and business partners. CRM sales force automation and direct marketing and fulfillment tools help company's cross- sell and upsell to their customers, thus increasing their profitability to the business. The value perceived by customers is the convenience of one-stop shopping at attractive prices.

### (iii) Retain

CRM analytical software and databases help a company proactively identify and reward its most loyal and profitable customers to retain and expend their business via targeted marketing and relationship marketing programs. The value perceived by customers is of a rewarding personalized business relationship with "their company".

## Q9. What are the majors components of CRM.

*Ans :*

### 1. Contact Management

CRM software enables sales, marketing and service manager to capture the relevant data about past and planned contacts of customers, business customers and based on life cycle events of customers. The main focus of this component is to capture information about on customer touch points like telephone, e-mail, website, retail store, kiosks and personal contact.

### 2. Account Management

CRM software maintains data about customers within the database. This allow integration of multiple customer account information and make it available within the company through Internet, intranet, marketing sales and CRM.

**3. Sales**

CRM system defines set of software tools that provide support to manage sale activities, optimal cross-selling and up-selling. For instance, sales prospect, product configuration, product information and sales quote capabilities. It provides real-time access,

(i) To specifies single common view of customers.

(ii) To enables customers to verify the account status of customers.

(iii) To verify the history prier to sales calls.

**4. Marketing and Fulfillment**

CRM system enables marketing executives/ professionals to perform direct marketing campaign by enabling automatic services like scheduling, target marketing, mailing etc. Besides this, it also emphasizes on following,

(i) It allows marketing professionals to capture the customers data/response present in the database and manage it.

(ii) It focuses on enhancing the business value/ customers of the company through direct marketing campaign.

(iii) It helps in fulfilling the request and response made by prospect and customers by enabling quick scheduling of sales contacts.

(iv) It provides accurate information about product and services to the prospects and customers.

(v) It allows capturing of desired information CRM database.

**5. Customer Service and Support**

CRM software defines set of software tools that provides service reps (representative) as well as real time access to the customers database which is managed by sale and marketing professionals. It also assist the customer service manager to create, manage and assign the customer service requesk The customers service support are of two types.

**6. Retention and Loyalty Program**

CRM system defines customers retention and loyalty as a business strategy that focuses on enhancing and optimizing the customer relationship management. Its primary objective is to provide,

(i) Companies identification

(ii) Rewards and recognition

(iii) Marketing to the customers who are loyal and profitable.

**Q10. Explain the benefits and failures of Customer Relationship Management.**

*Ans :*

**Benefits**

- CRM allows a business to identify and target their best customers; those who are the most profitable to the business, so they can be retained as lifelong customers for greater and more profitable services.
- CRM enables real-time customization and personalization of products and services based on customer wants, needs, buying habits, and life cycles.
- CRM can keep track of when a customer contacts the company, regardless of the contact point.
- CRM enables a company to provide a consistent customer experience and superior service and support across all the contact points a customer chooses.

**Failures**

- Major reason for the failure of CRM systems is the lack of understanding and preparation.
- Rely on CRM to solve business problem without first developing the business process changes and change management programs that are required.
- CRM projects implemented without the participation of the business stakeholders.

**Q11. Explain the different categories of Customer Relationship Management.**

*Ans :*

Four types (or) categories of CRM that are being implemented by many companies today include:

**(i) Operational CRM**

Supports customer interaction with greater convenience through a variety of channels. Synchronizes customer interactions consistently across all channels.

**(ii) Analytical CRM**

Extracts in-depth customer history, preferences, and profitability information from data warehouse and other databases. Allows analyzing, predicting, and deriving customer value and behavior and forecasting demand. Customers are given offers that are tailored to their needs.

**(iii) Collaborative CRM**

Enables easy collaboration with customers, suppliers, and partners. Improves efficiency and integration throughout the supply chain. Allows greater responsiveness to customer needs through sourcing of products and services outside of your enterprise

**(iv) Portal-based CRM**

Provides all users with the tools and information that fit their individual roles and preferences. Empowers all employees to respond to customer demands more quickly and become truly customer-focused. Provides the capability to instantly access link, and use all internal and external customer information.

### 4.1.1.4 Expert System

**Q12. Explain the concept of Expert System.**

*Ans :* **(Imp.)**

Expert systems are an intelligent technique for capturing tacit knowledge in a very specific and limited domain of human expertise. These systems capture the knowledge of skilled employees in the form of a set of rules in a software system that can be used by others in the organization. The set of rules in the expert system adds to the memory, or stored learning, of the firm.

Expert systems lack the breadth of knowledge and the understanding of fundamental principles of a human expert. They typically perform very limited tasks that can be performed by professionals in a few minutes or hours, such as diagnosing a malfunctioning machine or determining whether to grant credit for a loan. Problems that cannot be solved by human experts in the same short period of time are far too difficult for an expert system.

However, by capturing human expertise in limited areas, expert systems can provide benefits, helping organizations make high-quality decisions with fewer people. Today, expert systems are widely used in business in discrete, highly structured decision-mak-ing situations.

**Working Mechanism**

Human knowledge must be modeled or represented in a way that a computer can process. Expert systems model human knowledge as a set of rules that collectively are called the knowledge base.

1. The strategy used to search through the knowledge base is called the inference engine. Two strategies are commonly used: forward chaining and backward chaining'.
2. In forward chaining, the inference engine begins with the information entered by the user and searches the rule base to arrive at a conclusion.
3. In backward chaining, the strategy for searching the rule base starts with a hypothesis and proceeds by asking the user questions about selected facts until the hypothesis is either confirmed or disproved.

## 4.2 DSS

**Q13. Define the term decision.**

*Ans :*

Decision is the best alternative, selected from a set of alternatives. Many users make various decisions related to either their personal or business life. Some of the personal decisions include "What items are to be prepared for dinner?" "When to arrange a party?", "Which dress to wear in a party?" On the other hand, business decisions that are made on regular basis include, "Which product to launch first in the market?", "What should be the price of the product?

**Q14. Explain the components of the decision support sytem.**

*Ans :* **(Imp.)**

A Decision Support System comprises of three main components.

(i) A database;

(ii) Model base; and

(iii) Software providing interactive dialogue facility for the manager.

**(i) Database**

The data in the database typically is a combination of master files (internal corporate data) and data from external sources.

**(ii) Model Base**

The second component of the DSS is a library of models to manipulate and analyse the data in the desired ways. The model base might include econometric models to forecast demand by industry and simulation models of the corporation.

**(iii) Dialogue Box**

A user interface is the third component. Through this, the user can communicate with the DSS. The physical interface generally consists of a terminal hooked up to the mainframe computer, either directly or by telephone. Micro-computers with modems are being used ever more frequently for this interface.

**Q15. Why decision support system are necesary for today's environment.**

*Ans :* **(Imp.)**

Having discussed the conceptual frame work for decision-making, let us now understand the need for computerised decision support systems. These systems have become necessary for today's manager because of the following reasons:

**(i) Fast Computation**

A decision-maker can perform a large number of compu-tations very quickly and that too at a low cost with the help of computer support systems. Today, in majority of the decisions, time is the essence.

**(ii) Enhanced Productivity**

Support systems can enhance the productivity of support staff and also enable the group members to discuss the problems among themselves at a distance.

**(iii) Data Transmission**

Sometimes the data, which may be stored at different locations, may be required to be transmitted quickly from distant locations. Computer support systems can search, store, and transmit the required data quickly and economically.

**(iv) Better Decisions:** Computer support systems can help a decision-maker in arriving at a better decision. For example, more alternatives can be evaluated, risk analysis be performed quickly, and views of experts from different places can be collected quickly and at a lower cost.

**(v) Competitive Edge:** Decision support systems enable the users to get a competitive edge over their competitors as these systems enable organisations to change their operations frequently, re-engineer processes and structures, empower employees and

innovate. Decision support technologies can create useful empowerment by allowing people to make good decisions, even if they lack some knowledge.

In view of the above-stated reasons, decision support systems are important tools in the hands of decision-makers, which come handy especially in their semi-structured to unstructured problems.

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**Q16. List out the characteristics of DSS.**

*Ans :*

1. DSS provide support for decision-makers mainly in semi-structured and unstructured situation by bringing together human judgements and computerised information. Such problem cannot be solved (or cannot be solved conveniently) by other computerised systems or by standard quantitative methods or tools.
2. Support is provided for various managerial levels, ranging from top executives to line managers.
3. Support is provided to individuals as well as to groups. Less-structured problems often require the involvement of several individuals from different departments and organisational levels or even from different organisations.
4. DSS provide support to several inter-dependent and/or sequential decisions. The decision may be made once, several times, or repeatedly.
5. DSS support all phases of the decision-making process: intelligence, design, choice, and implementation.
6. DSS support a variety of decision-making processes and styles.
7. DSS are adaptive over time. The decision-maker should be reactive, able to confront changing condition quickly, and be able to adapt the DSS to meet these changes. DSS are flexible, and so user can add, delete, combine, change or rearrange basic elements.
8. Users must feel at home with DSS. User-friendliness, strong graphical capabilities, and an English-like interactive human machine interface can greatly increase the effectiveness of DSS. DSS attempt to improve the effectiveness of decision-making (accuracy, timeliness, quality) rather than its efficiency (the cost of making decisions).
9. The decision-maker has complete control over all steps of the decision-making process in solving a problem. A DSS specifically aims to support and not to replace the decision-maker.
10. End users should be able to construct and modify simple systems by themselves. Larger systems can be built with assistance from information system (IS) specialists.
11. A DSS usually utilises models for analysing decision-making situations. The modeling capability enables experimenting with different strategies under different configurations.

**Q17. Discuss about advantages and disadvantages of DSS?**

*Ans :* **(Imp.)**

**Advantages**

**1. Improving personal efficiency**

many DSS do not do anything. A person could not do himself or herself. People prepared budgets for centuries before spreadsheet software came in to use. DSS help them do it faster and with less change of error.

**2. Improving problem solving**

DSS can make it possible for a person or a group to solve problem faster or better, than they could without it.

**3. Facilitating communications**

After found that DSS facilitating interpersonal communication in several ways. In addition technology developments that have occurred since his or her research have opened up for DSS to provide this benefit.

**4. Promoting learning or training**

Using a DSS can also help people learned more about using computers and about software package that are in the DSS although this is seldom a specific objective of developing the DSS it can be valuable by project.

**5. Increasing organisational control**

Some DSS can also control information about an individual's decision to his or her managers.

**Disadvantages**

**1. Limited storage capability**

Due to its small memories and limited storage capabilities, DSS has definite computational constraints.

**2. Slow**

It is slow compared to the speed of large mainframes.

**3. Limited information sharing**

Most DSSs are designed for individual use but they can be designed so that several computers can be linked for limited information sharing.

**4. Difficult**

It is difficult to know interdependencies of functions provided by system.

**5. Require extensive knowledge**

There are applications that require extensive knowledge of specific problem domain or technical knowledge.

**6. Translation problems**

Users have to deal with several databases and model each with different data models and resulting translation problems.

**7. Confliction**

Users may have to work on several decision scenarios at same time. As a consequence they have to keep track of what they done for each of them.

**Q18. What are the applications can be used in DSS?**

*Ans :*

Application of a DSS can be classified into following three categories:

**1. Independent problems**

The independent problems are "Standalone problems" whose solutions are independent of other problems. The goal is to find the best solution to the given problem.

**2. Interrelated problem**

In interrelated problems solutions are interrelated by each other to find the most effective solution to the group of interrelated problem. These types of problems usually require team effort.

**3. Organisational problems**

In Organisational problems all departments within an organisation are included. Such problem required team effort. TQM is a good example of an organisational effort because for it to be effective it requires a joint effort from all departments units in the organisation.

## 4.3 BUSINESS INTELLIGENCE + PROCESS MANAGEMENT

**Q19. Explain briefly about Business intelligence.**

**(OR)**

**Define Business intelligence. Explain the importance of Business intelligence**

*Ans :* **(Imp.)**

Business intelligence (BI) is a set of theories, methodologies, architectures, and technologies that transform raw data into meaningful and useful information for business purposes. BI can handle enormous amounts of unstructured data to help identify, develop and otherwise create new opportunities.

The purpose of the BI is to improve the quality of the input for decision making. It helps the managers to understand the internal capabilities of the organization. The trends and future directions in the markets. It also tells about the behaviour of the competition.

The following reasons illustrate the importance of business intelligence.

**1. Better Information Extract**

As already discussed that there are lots of business transactions processed everyday and huge amount of data is generated. Manually tabulating and accessing is no longer feasible. Therefore, business intelligence provide effective ways of monitoring and accessing relevant data whenever required.

**2. Decision Making**

Most of the business projects fail due to the in appropriate decision making and lack of information availability. BI provides detailed past and present performance of all the operations related to the organization which helps in taking appropriate decision by considering the future predictions.

**3. Boost Productivity**

With effective methods of BI, data gathering and creating reports can be done be done very easily and quickly. This makes the employees to be more productive on their own tasks.

With all these features (creating quick reports, decreased operating costs, improved quality and timeliness provides a good ROI (Return on Investment) to the company.

**Q20. List out the various styles of Business Intelligence.**

*Ans :*

**1. Enterprise Reporting**

Broadly deployed pixel-perfect report formats for operational reporting and score cards/dashboards targeted at information consumers and executives.

**2. Cube Analysis**

OLAP slice-and-dice analysis of limited data sets, targeted at managers and others who need a safe and simple environment for basic data exploration within a limited range of data.

**3. Ad Hoc Query and Analysis**

Full investigative query into all data, as well as automated slice and-dice OLAP analysis of the entire database - down to the transaction level of detail if necessary. Targeted at information explorers and power users.

**4. Statistical Analysis and Data Mining**

Full mathematical, financial, and statistical treatment of data for purposes of correlation analysis, trend analysis, financial analysis and projections. Targeted at the professional information analysts.

**5. Alerting and Report Delivery**

Proactive report delivery and alerting to very large populations based on schedules or event triggers in the database. Targeted at very large user populations of information consumers, both internal and external to the enterprise.

**Q21. Briefly explain the various benefits of Business Intelligence.**

*Ans :*

**Benefits of Business Intelligence**

**1. Time Savings**

One of the key advantages of Business Intelligence is that most business processes are automated, which generates important savings both in time and costs, and in turn contributes to increasing overall productivity levels.

**2. Easier and quicker access to information**

It is clear that, over the last few years, the amount of business data has propelled. Therefore, it is important that companies focus their efforts on digitizing and collecting their data via document management software. However, it is equally important that Business Intelligence tools offer easily accessible information that clearly shows the evolution of the data and, this way, allows companies to anticipate future events.

**3. Correct and relevant decisions**

In order to stand apart from the competition, reduce costs, and increase profits, a company must make intelligent decisions. To do this, these decisions must logically be based on trustworthy and relevant data, and this is exactly where traditional methods begin to fail.

**Q22. List out the various disadvantages of business intelligence.**

*Ans :*

**Some of the major Business Intelligence disadvantages are:**

**(i) Piling of Historical Data**

The major objective of Business intelligence system is to stockpile past data about a firm's deals and reveal it in such a way that it permits professionals in decision making. On the flip side, this information generally amounts to a small portion of what the firms actually require to function, besides its restrained worth. While in other situations, the user may not have interest in historical data as many markets that the company regulates are in frequent alteration.

**(ii) Cost**

Business intelligence at times can be a little too much for small as well as for medium sized enterprises. The use of such system can be expensive for basic business transactions.

**(iii) Complexity**

Another disadvantage of business intelligence could be its complexity in implementation of data. It can be so intricate that it can make business techniques rigid to deal with. In the view of such premise, many business experts have predicted that these intricacies can ultimately throttle any business.

**(iv) Muddling of commercial settings**

Business Intelligence can cause commercial settings to turn out to be much more muddled.

**(v) Limited use**

Like all improved technologies, business intelligence was first established keeping in consideration the buying competence of affluent firms. Even today BI system cannot be afforded by most of the companies. Although, traders in the past few years have started modifying their services towards medium and small sized industries, but the fact is that many of such firms does not consider them to be highly essential, for its complexity.

**(vi) Time Consuming Implementation**

Many firms in today's fast paced industrial scenario are not patient enough to wait for the execution of Business intelligence in their organization. It takes around 18 months for data warehousing system to completely implement the system.

**Q23. Explain the applications of business intelligence.**

*Ans :* **(Imp.)**

The following are the applications of business intelligence are :

1. Retailing
2. Credit card Management
3. Insurance
4 Telecommunications
5. Telemarketing
6. Human resource management.

**1. Retailing**

Retailers in general and grocery stores in particular, can get valuable predictive information from data mining. Grocery stores generate huge amount of data that require automated tools for analysis. Now-a-days, data mining tools can be employed on this data stored in data warehouse to find the likings, disliking, shopping behaviour and other patterns, etc., and thus become very effective in formulating and implementing retailing strategies.

**2. Credit Card Management**

Data mining can also be used in credit card management. From a large number of credit card users, banks can find out the most profitable customers and also can target its credit card campaign to the right set of potential customers. Data warehouses provide information that allows issuers more accurately predict what the customer is interested in, as well as the customer's potential value to the issuer.

**3. Insurance**

The insurance industry can also find useful applications of data mining tools to detect frauds and to market its products. By linking names, telephone numbers, streets, birthdays, and other information with slight variations, patterns indicating fraud can be identified. Consolidating data internal and external to the insurance company creates a data mart that can be used for advanced search.

**4. Telecommunications**

In the last two decades, telecommunication industry has seen a new revolution. With so many players, it has really become difficult to retain the customers. The phenomenon of a customer switching carriers is referred to as chum, a fundamental concept in telephony as well as in other fields. Analysis using data mining can reduce this customer churn to a great extent.

**5. Telemarketing**

Telephone providers are among the many marketing operations utilizing telemarketing. Data mining can be used on the collected data to determine segments based on common characteristics, like the set of customers who respond to new promotions; the set of customers who respond to discounts; or the set of customers who respond to new product offers. Once segments have been defined, on-line analytic processing tools can be used to explore in greater depth.

**6. Human Resource Management**

In the human resources field, this analysis can lead to identification of individuals who are liable to leave the company unless additional compensation or benefits are provided. A firm might know that 20 per cent of its employees use 80 per cent of services offered, but may not know which particular individuals are in that 20 per cent.

Business intelligence provides a means of identifying segments so that programs can be devised to cut costs and increase productivity. Data mining can also be used to examine the way in which an organization uses its people. It can help determine whether the most talented people are working for those business units with the highest priority or where they will have the greatest impact on profit.

**Q24. List out and briefly describe the components of a contemporary business intelligence infrastructure.**

*Ans :*

**Components of a Contemporary Business Intelligence**

The infrastructure of the business intelligence offers array of tools for attaining information through distinct types of data utilized by the business. This also takes into account structured and unstructured big data.

The components of contemporary business intelligence infrastructure includes.

1. Datawarehouses
2. Data marts
3. Hadoop
4. In-memory processing
5. Analytical platforms.

**1. Datawarehouses**

It encompasses current storage and historical data from various operational transaction systems. It combines and standardizes information from across the enterprise. It also provides query, analysis and reporting tool.

**2. Data Marts**

It is a subset of datawarehouse. It encompasses summarized or highly focused part of firms data particularly for large population of users. It is used for only one subject or line of business.

**3. Hadoop**

It is an open-source software framework. It allows distributed parallel processing of large quantity of data spreaded across computers. The existing problems are disintegrated into smaller problems, which are then processed on a distributed network having smaller computers. The generated result then integrated into smaller data set. The size is small because, it is easy to analyze. It empasizes on processing of non-relational database, structured, semi structured and unstructured.

**4. In-memory Processing**

It is based on computer's main memory for storing the data. It minimizes the drawback such as bottlenecks caused from retrieving and ready the data within the traditional database. It also lessens the query response times. The in-memory computing is possible in complicated contemporary computer hardware.

**5. Analytical Platforms**

It emphasizes upon relational as well as non-relational technology for large datasets analyses. They uses preconfigured software and hardware system processing the queries and analytics.

**Q25. Define business process. Management and its purpose.**

*Ans :*

Business process management (BPM) is the discipline of improving a business process from end to end by analyzing it, modelling how it works in different scenarios, executing improvements, monitoring the improved process and continually optimizing it.

A business process is an activity or set of activities that will achieve an organizational goal. BPM is not a one-time task, but rather an ongoing activity that involves persistent process reengineering.

BPM is not a technology. It often involves using intelligent BPM approaches to automate tasks or workflow, but automation is not required.

Organizations engaged in BPM can choose to follow one of the various BPM methodologies, which include Six Sigma and lean management.

**Purpose**

BPM is used on an ongoing basis for business process improvement.

A business process can involve any one of hundreds or thousands of tasks and the workflows and approvals required to complete the task. Common examples include the following:

- fulfilling a product order;
- updating the associated accounts;
- updating relevant databases;
- approving and remitting an invoice; and
- onboarding a new employee.

It aims to improve the order, insight and efficiency of the collective workflows that make up a business process. BPM reduces chaos within workflows and eliminates ad hoc workflow management.

The goal for organizations engaged in BPM is to take control of their processes and continually optimize them. This approach creates a more efficient organization better able to deliver products and services and adapt to changing needs.

**Q26. State the benefits of BPM.**

*Ans :*

BPM is not a one-time task. Processes must be managed on a continuing basis. Companies should focus on improving them from start to finish and not simply look at individual tasks.

BPM helps managers in the following ways:

- understand the processes that happen within their organizations;
- analyse them from start to finish;
- continually improve processes and business strategy;
- have a greater impact on business outcomes;
- adapt business process to market trends and industry requirements; and
- capitalize on emerging technologies.

Well-executed BPM can produce benefits for the business as a whole, such as the following:

- reduce waste;
- cut errors;
- save time; and
- generate better products and services.

**Q27. Explain various types of BPM.**

*Ans :*

Various approaches to BPM offer different perspectives on business activities and what components of the business they revolve around. The three main types include the following:

**1. Systems-centric**

This type of BPM focuses on business processes that work with a business-integrated system without much human involvement. The processes often use workflow automation within a business's integrated applications. Customer relationship management applications and enterprise resource planning applications are two examples.

**2. Human-centric**

BPM can also focus on processes that people handle. These applications have features designed for human interaction, such as a well-designed user interface and notifications.

**3. Document-centric**

This approach centres on documents, such as formatting, signing and verifying contracts. Often business process management tools specialize in a specific document-centric task, such as signing.

**Q28. Discuss the life cycle of BPM.**

*Ans :* **(Imp.)**

**Stages in the BPM Life Cycle**

**1. Planning and Strategic Alignment**

The first stage of the BPM life cycle involves gaining an in-depth understanding of how processes are aligned with the value chain.

Typical activities undertaken in this stage may include:

- Organization profiling
- Identifying primary, management, and support processes
- Noting key performance indicators (KPIs)
- Preparing for process analysis
- Primary processes are an organization's core operations. They directly bring value to the customers. All processes that involve designing, creating, and selling of products or services to customers are considered primary.
- Secondary processes support the primary processes. Examples include human resources, IT management, procurement, office administration, and so on.
- Management processes involve monitoring primary and secondary processes to ensure that the organization is meeting overall financial and operational goals. These processes also involve activities to ensure compliance with regulatory guidelines.

**2. Process analysis**

- In the analysis stage, one needs to observe the process as it is currently practiced in order to get a complete picture. It has to necessarily precede modelling if effective changes are to be introduced.
- Based on the nature of the processes, the method of analysis chosen may be qualitative or quantitative. In general, however, the analysis includes interviewing process performers, analysing available process documentation, and arriving at a complete picture of how processes are being executed.

**3. Process Design**

Observations from process analysis are put to use in the design stage. At this point, you should have awareness of bottlenecks, lags, and delays in detail.

The important question to answer is whether the process should be retained as is or redesigned to fix the issues identified. Based on the response, you may approach it in one of two ways:

- Continuous process improvement wherein the process is accepted in its current structure and issues are corrected one after another, or
- Redesign, wherein the entire process is remodelled in its entirety.

Once process modelling is complete, new procedures need to be approved. A deployment plan is created to ensure that relevant process performers are trained for the changes and transitions are smooth

**4. Implementing the process**

When it comes to implementing the new process design, there are two ways to execute it: systemic and non-systemic implementation. The former uses specific software or tools for implementation while the latter doesn't.

The choice between the two types depends on the nature of the business process and resources available to the organization.

However, the goal remains the same– to put into practice the workflow designed in the previous stage.

**5. Process Monitoring**

In this stage, previously identified KPIs are monitored to ensure that the process is aligning with the organization's overarching goals. Here, one would typically be tracking, measuring, and controlling on a continuous basis.

Some common KPIs that are monitored include the duration of the process, cost of the process, capacity or how much the process can produce, and errors or issues that adversely affect customer satisfaction.

Information gained during process monitoring will help you gauge if the process needs any changes or tweaks and the redesigned process is meeting goals and objectives.

**6. Process Refinement**

In the refinement stage, one makes the effort to close the gap between current performance and the modelled process with carefully measured changes.

The BPM life cycle is based on the notion of continuous process improvement. The cycle is repeated as the organization attempts to enhance performance and boost growth. Here is a 5-step guide to increase process efficiency.

**Q29. Compare and contrast BPM and BI**

*Ans :* **(Imp.)**

| | Area | BPM | BI |
|---|---|---|---|
| 1. | **Definition** | BPM refers to the different business tools, methods and metrics employed by an organization to measure, monitor and manage business performance. | BI refers to the art and science of analysing any data or information, with a specific business objective, |
| 2. | **Scope** | The scope of BPM is wider. Impact BPM can be considered as an outgrowth of BI. | The scope of BI is comparatively narrower. |
| 3. | **Tools** | BPM employs multiple tools, methods and metrics, which includes all the BI tools as well. | BI employs a wide variety of tools and techniques such as OLP adhoc querying, dashboards, score-cards etc. |
| 4. | **Processes involved** | It involves multiple processes including BI + , planning, cycle of plan, monitoring and analysing of business performance. | BI processes are limited only upto analysing of business data. |



## 4.4 SYSTEMS DEVELOPMENT, AND SECURITY

**Q30. What are the various stages of System Development? Explain in detail each stages.**

**(OR)**

**Discuss the stages in system development.**

**(OR)**

**Briefly explain the phrases involved in system development.**

*Ans :* **(Imp.)**

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:

**1. System Investigation**

Some problem may be bothering a business organisation. The managers in the organisation (user) may or may not be very clear about the problem. The user may invite a system analyst or information analyst (consultant) to assist him/her in defining and resolving the problem in a clear way.

Preliminary investigation is the first step in system development project. The preliminary investigation is a way of handling the user's request to change, improve or enhance an existing system. The objective is to determine whether the request is valid and feasible before any recommendation is made to do nothing, improve or modify the existing system, or build altogether a new one. It is not a design study, nor does it include the collection of details to completely describe the business system. These objectives should be accomplished, while working on the preliminary investigation. System investigation includes the following two sub-stages:

(i) Problem definition, and

(ii) Feasibility study.

**(i) Problem Definition**

Although the need for problem definition may seem obvious, this is perhaps the most frequently bypassed step in the entire system development process. So the first responsibility of a system analyst is to prepare a written statement of the objectives and scope of the problem. Based on interviews with the user, the analyst writes a brief description of his/her understanding of the problem, and reviews it with both groups, ideally in a joint user/information analyst meeting. People respond to written statements. They ask for clarifications and they correct obvious errors or mis-understandings. This is why a clear statement of objectives is so important.

Here are some possible definitions of problems:

(a) The existing system has a poor response time, i.e. it is slow.

(b) It is unable to handle the workload.

(c) The problem of cost, i.e. the existing system is not economical.

(d) The problem of accuracy and reliability.

**(ii) Feasibility Study**

The literal meaning of feasibility is viaility. This study is undertaken to know the likelihood of the system being useful to the organisation. Feasibility study, is basically, a high-level capsule version of the entire process, intended to answer a number of questions like what is the problem? Is the problem even worth solving? However, as the name indicates in preliminary investigation, feasibility study should be relatively brief, as the objective at this stage is only to get an idea of the scope. The finding of this study should be formally presented to the user management. This presentation marks a crucial decision point in the life of the project. If the management approves the project, the feasibility study report represents an excellent model of the system analyst's understanding of the problem and provides a clear sense of direction for the subsequent development of the system.

**2. System Analysis**

Analysis is a detailed study of the various operations of a business activity (system), along with its boundaries. The objective of this phase is to determine exactly what must be done to solve the problem. Many system analysis have a technical background. The temptation of many technically trained people is to move too quickly to program design, to become pre-maturely physical. Such a temptation must be avoided. Rather a logical model of the system should be developed using various modern tools such as data flow diagrams, an elementary data dictionary and rough descriptions of the relevant algorithms. System analysis involves a detailed study of:

(i) The information needs of the organisation and its end users.

(ii) Existing information systems (their activities, resources and products).

(iii) The expected information system (in terms of capabilities of IS required to meet the information needs of users).

**3. System Design**

System analysis describes WHAT a system should do to meet the information needs of users. System design specifies HOW the system will accomplish this objective. The term design refers to the technical specification (analogous to the architect's blue prints) that will be implied in constructing the system. System design should stress on the following three activities:

(i) User interface,

(ii) Data design, and

(iii) Process design.

**4. Construction and Testing**

Once the system specifications are understood, the system is physically created. The required programs are coded, debugged, and documented. The system should be tested with some test data to ensure its accuracy and reliability. In fact, construction of the system takes place on the basis of the system design specifications. So in this phase, the various directions as per system specifications are followed. In addition to the activities performed during system development, some activities are performed after the basic development is complete. Such activities are covered under the implementation phase and maintenance phase.

**5. Implementation**

The system implementation stage involves hardware and software acquisition, site preparation, user training and installation of the system. Here again, testing of the system, involving all components and procedures should be done. It must be realised that implementation may be the most crucial phase of System Development Life Cycle, because this step is vital in assuring the success of any newly developed system.

**6. Maintenance**

System maintenance involves the monitoring, evaluating and modifying of a system to make desirable or necessary improvements. In other words, maintenance include enhancements, modifications or any change from the original specifications. Therefore, the information analyst should take chance as his/her responsibility so as to keep the system functioning at an acceptable level.

**Q31. Define the term security. Discuss the Implication of IS security and controls.**

*Ans :* **(Imp.)**

The term security refers to state of being protected from harm or from those that cause negative effects. Examples can be protecting banks from robbery, computers from viruses, data from unauthorized access etc. Also, in information technology, security is applied upon different aspects such as, information network, database etc.

**IS Security Technologies**

**(a) Firewall**

A firewall refers to a protection device that selectively discriminates against data flowing out or into the organisation based on the pre defined rules. A firewall protects unauthorised access to ISs over the Internet. It may be a hardware and software that stops access to ISs resources. Thus, a firewall, which acts like a watchman, will not allow any unauthorised user to access the server of an organisation. A firewall can also be used as a front line defense against attacks, as through a firewall, only a few types of protocols can be allowed to enter and thus the incoming data for any probable viruses or any attempt to attack on the IS resources can be screened. In other words, a firewall can restrict the sites from viewing which might have threat of attacks.

**(b) Proxy Servers**

A proxy server, as the name implies, acts as a representative of the true server of an organisation. It is another approach of IS

security measures which performs actions on behalf of another system. A proxy server is configured to look like a web server with the domain name of the true server of the organisation. When any person from outside requests a particular web page, the proxy server receives the request, and in turn asks for the information from the true server, and then responds to the request of a person as a proxy for the true web server. Thus the person gets the information without getting in direct contact with the true web server.

**(c) Authentication and Data Encryption**

As already mentioned, these controls refer to the restrictions imposed for unauthorised access to IS resource. Before gaining an access to IS resource, it is important to prove the identity of the user as well as to authenticate the message sent by an individual or an organisation. Authentication is the validation of a user's identity. For the authorised access, a user is given a password or personal identification number, which is a private word or combination of characters.

The password is known only to the authorised person. It is suggested that the password should not be simple to guess, meaning it should not be associated with the user, such as a spouse's, children's name, date of birth, car number, etc. Also the password must be changed at regular intervals. ID cards, ATM cards, smart cards are the other access control measures, through which the user's identity is proved.

A smart card contains a chip that can verify and validate a number of pieces of information along with the PIN, whereas ID cards, or ATM cards, contain magnetic stripes, on which user personal identification number is stored, which is compared against the input of the jser. Under bio-metric access control, the human characteristics, which are considered as unique and can be used to recognize a person, namely, fingerprints and retina of the eye are scanned and converted to images and are stored in digitised format. The subsequent scan, used to verify the authenticity, is also digitised and then compared with the stored digitised value.

**(d) Digital Signatures**

Digital signatures, which are analogous to physical signatures, are used to authenticate the identity of the sender of a message and also guarantee that the sent message has not been modified. Digital signatures are encrypted messages that are verified as authentic by an independent central facility. The digital signatures, which are implemented with public-key cryptography, are created in two phases. First, the encryption programme uses a mathematical algorithm/ formula to create a message digest for the message is to be transmitted.

**(e) Digital Certificates**

A digital certificate is an electronic document, which is attached to the message certifying that the message is from the sender it claims to be from and has not been modified from the original format. Thus, a digital certificate is like a digital signature, which is used to authenticate the sender as well as the content. A digital certificate associates one's identity with one's public key. Digital certificates are issued by organisation which is then called a certificate authority. The information like sender's name, serial number, expiration date, and a copy of the certificate holder's public key along with the digital signature of the certificate authority are stored on the digital certificate. This information is used to verify the authenticity of the certificate.

**IS Controls**

Similarly, the organisation can plan and implement various kinds of IS controls so as to avoid, reduce and manage the risks of the potential threats to information systems. These controls can be understood under the following five categories, namely

(i) Physical Controls

(ii) Technical Controls

(iii) Administrative Controls

(iv) General Controls

(v) Application Controls

**(i) Physical Controls**

As the name implies, these controls refer to the protection of computer facilities and other IS resources. This includes protecting computer hardware, computer software, database, computer networks, etc. Physical security of the IS resources include various controls such as:

- The location and layout of the computer centre must be decided keeping in view the physical security of the IS resources. For example, organizations would like to decide that the site of computer centre should be water proof and fire proof.
- The site should have proper air-conditioning systems, extinguishing systems, adequate drainage facilities and emergency power shutoff and backup systems.

**(ii) Technical Controls**

The technical controls are the controls which are implemented in the application of IS itself. These types of controls include access controls, data security controls, communication controls, etc.

- **Access Controls:** These controls refer to the restrictions imposed for the unauthorised access of any user to IS resource. In other word, a user, in order to gain access, must be authorised and before he/she is given an access, must be authenticated. The identification of the user can be obtained through a unique user identifier, such as the password, a smart card, digital signature, voice, fingerprint, or retinal (eye) scan.

Unique user identifier is normally implemented through bio-metric controls. A biometric control is an automated method of verifying the identity of an individual, based on physiological or behavioural characte-ristics.

- **Data Security Controls :** To protect data from accidental or intentional disclosure to unauthorised person, or from unauthorised changes or destruction, data security controls are very useful, which can be implemented through operating systems, database security, access control programmes, backup and recovery procedures, etc. Organizations should make sure that in the event of any security breach, there is no data loss. For this, organizations must have a clear cut policy in place and must implement data security controls like taking of backup of all data periodically, duplicate the data automatically on regular intervals, etc.
- **Communication Controls:** With an increased use of the Internet, intranet and electronic commerce, communications controls have become all the more important. Various communication controls include access control, data encryption, firewalls, etc.

**(iii) Administrative Controls**

Administrative controls which include clear guidelines, policies of the organizations with regards to the use and deployment of IS resources are very important in protecting ISs. For example, email policy, internet use policy, access privileges of employees, programming and documentation standards, etc., fall under the category of administrative controls.

**(iv) General Controls**

There may be some controls, which are categorised as general controls. These controls are implemented so as to ensure that ISs are protected from various potential threats.

**For example**, system development controls like budgeting, schedule, quality, etc.,

are meant to ensure that a quality system is developed within the budgeted cost and competed on time.

**(v) Application Controls**

The application controls, as the name implies, are embedded within the application itself. These controls are usually written as validation rules. These controls are popularly known as input controls, processing controls, and output controls.

**Q32. What is a computer virus. How can viruses damage a computer information system.**

*Ans :*

A computer virus is a malicious program that self-replicates by copying itself to another program. In other words, the computer virus spreads by itself into other executable code or documents. The purpose of creating a computer virus is to infect vulnerable systems, gain admin control and steal user sensitive data. Hackers design computer viruses with malicious intent and prey on online users by tricking them.

One of the ideal methods by which viruses spread is through emails – opening the attachment in the email, visiting an infected website, clicking on an executable file, or viewing an infected advertisement can cause the virus to spread to your system. Besides that, infections also spread while connecting with already infected removable storage devices, such as USB drives.

It is quite easy and simple for the viruses to sneak into a computer by dodging the defense systems. A successful breach can cause serious issues for the user such as infecting other resources or system software, modifying or deleting key functions or applications and copy/delete or encrypt data.

**Q33. Explain briefly about various Inter Network Security Defenses.**

*Ans :* **(Imp.)**

The following are the various inter Network Security Defenses are as follows :

**1. Encryption**

- Process of encoding messages in such a way that eavesdroppers or hackers cannot read it, but that authorized parties can.
- Important way to protect data and other computer network resources, especially on the Internet, intranets, and extranets.
- Encryption data in transit also helps to secure it as it is often difficult to physically secure all access to networks.
- Encryption can protect confidentiality of messages.
- Encryption can be used to protect data "at rest", such as files on computers and storage devices.
- Encryption programs are sold as separate products or built into other software used for the encryption process.
- RSA and PGP (Pretty Good Privacy) are the top encryption software.
- RSA stands for Ron Rivest, Adi Shamir and Leonard Adleman, who first publicly described the algorithm in 1977.
- Encryption involves using special mathematical algorithms, or keys, to transform digital data into a scrambled code before they are transmitted, and then to decode the data when they are received.

**2. Email Monitoring**

- Email monitoring tools typically focus on the health of email servers because the servers can be a single point of failure in the email environment.
- Email monitoring tools can track both the health of the email serving application itself and that of the server

on which the application runs.

- Email monitoring helps email administrators keep email flowing in complex network environments.
- Internet and other online e-mail systems are one of the favorite avenues of attack by hackers for spreading computer viruses or breaking into networked computer.
- E-mail is also the battleground for attempts by companies to enforce policies against illegal, personal, or damaging messages by employees versus the demands of some employees and others who see such policies as violations of privacy right.

**3. Virus Defenses**

- Virus defenses create to protected our PC from the latest viruses, worms, Trojan horses, malware and other malicious programs that can wreaks havoc on our PC.
- Nowadays, many corporate antivirus protection is a centralized function of information technology.
- The antivirus software runs in the background, popping up every so often to reassure you.
- Many companies are building defenses against the spread of viruses by centralizing the distribution and updating of antivirus software as a responsibility of their IS departments.
- One reason for this trend is that the major antivirus software companies like a McAfee (Virus Scan) and Symantec (Norton Antivirus) have developed network versions of their programs, which they are marketing to ISPs and others as a service they should offer to all their customers.

**4. Denial of Service(DOS)**

- Major attacks against e-commerce and corporate Web sites in the past few years have demonstrated that the Internet is extremely vulnerable to a variety of assaults by criminal hackers.
- Depends on three layers of networked computer systems:
  1. The victim's Web sites,
  2. The victim's Internet services providers (ISP), and
  3. The sites of "zombies" or slave computers that the cyber-criminals commandeered.

**Defending against Denial of Services**

- **At the zombie machines:** Set and enforces security policies. Scan regularly for Trojan horse programs and vulnerabilities. Close unused ports. Remind users not to open .exe mail attachments.
- **At the ISP:** Monitor and block traffic spikes. Filter spoofed IP address. Coordinate security with network providers.
- **At the victim's Web site:** Create backup servers and networks connections. Limit connection to each server. Install multiple intrusion detection systems and multiple routers for incoming traffic to reduce choke points.

**5. Firewall**

- Another important method for control and security on the Internet and other networks is the use of firewall computers and software.
- As a gatekeeper systems that protects a company's intranets and other computer networks from intrusion by providing a filter and safe transfer point for access to and from the Internet and other networks.
- External firewall keeps out unauthorized Internet users


- Internal firewall prevents users from accessing sensitive human resources or financial data.
- Passwords and browser security features control access to specific intranet resources.
- Intranet server features provide authentication and encryption where applicable.
- Network interface software is carefully crafted to avoid creating security holes to back-end resources.

**Other Security Measures**

- **Security Codes**
  - Multilevel password system
  - Encrypted passwords
  - Smart cards with microprocessors
- **Backup Files**
  - Duplicate files of data or programs

- **Security Monitors**
  - Monitor the use of computers and networks
  - Protects them from unauthorized use, fraud, and destruction
- **Biometrics**
  - Computer devices measure physical traits that make each individual unique
    - Voice recognition, fingerprints, retina scan.
- **Computer Failure Controls**
  - Prevents computer failures or minimizes its effects
  - Preventive maintenance
  - Arrange backups with a disaster recovery organization
- **Computer system fails because of electrical**
  - Supplies, telecommunication problems, virsuses,
- **Other Security Measures**
  - In the event of a system failure, fault-tolerant systems have redundant processors, peripherals, and software that provide
    - **Fail-over capability:** shifts to back up components
    - **Fail-save capability:** the system continues to operate at the same level
    - **Fail-soft capability:** the system continues to operate at a reduced but acceptable level
- **A disaster recovery plan contains formalized procedures to follow in the event of a disaster**
  - Which employees will participate
  - What their duties will be
  - What hardware, software, and facilities will be used
  - Priority of applications that will be processed
  - Use of alternative facilities
  - Offsite storage of databases

# Short Question and Answers

**1. What is meant by advanced MIS?**

*Ans :*

The advanced information systems that help in managing business organizations are referred to as advanced Management Information Systems (MIS). Examples of advanced MIS are Expert Systems and Knowledge Management Systems.

**2. Supply chain management?**

*Ans :*

Supply chain management (SCM) is a management concept that integrates the management of supply chain processes. Many companies are making SCM a top strategic objective of their E-business initiatives. It is an absolute requirement if they want to meet their E-commerce customer value imperative. Companies are reengineering their supply chain processes through the aid of Internet technologies and supply chain management software.

**Definitions**

**(i)** **According to Jones and Riley,** "Supply chain management deals with the total flow of material from supplier through end user".

**(ii)** **According to Cooper and Ellram,** "Supply chain management is an integrative philosophy to manage the total flow of distribution channel front the supplier to the ultimate user".

**(iii)** **According to Marty Weil,** "Supply chain management is the ability to get closer to the customer".

**(iv)** **According to Professor Douglas M. Lambert,** "Supply chain management as the integration of business process from the end user through original suppliers who provide products, services, and information that adds value for the customer".

**3. Objectives of Supply chain management.**

*Ans :*

The objectives of supply chain integration are to supply superior quality goods faster, with efficient processes and in essence be more responsive to the perceptions of the marketplace and be able to change directions at will. Some of the consequences of supply chain integration result in.

**1. Supply chain planning**

Planning sets directions for the enterprise

**2. Procurement**

Establishing what needs to be purchased, selecting suppliers & managing relations with them, reducing costs, improving possibly raw material.

**3. Inventory management**

Managing levels of inventory in order to satisfy internal and external customers demand.

**4. Packaging**

Ensuring correct package design in order to encourage the recycling of packaging and reducing packages costs.

**5. Facility design**

This includes insuring the best design that suits the internal or external customers. Here we are concerned with the issue such as : Size, Lightning, facilities, equipment , safety and security.

**6. Warehousing**

This includes stock management, efficient facility operations, layouts for effective transportation, safety, storage methods and equipment.

**7. Transportation**

This includes transportation modes, costs, transportation management, terminal utilization, and intransit care of goods.

**8. Reverse logistics**

The reduction where possible of product errors so that reverse logistics may be reduced.

**4. What is Knowledge Management?**

*Ans :*

**Meaning**

Knowledge Management System (KM System) refers to a (generally IT based) system for managing knowledge in organizations for supporting creation, capture, storage and dissemination of information. It can comprise a part (neither necessary nor sufficient) of a Knowledge Management initiative.

The idea of a KM system is to enable employees to have ready access to the organization's documented base of facts, sources of information, and solutions. For example a typical claim justifying the creation of a KM system might run something like this: an engineer could know the metallurgical composition of an alloy that reduces sound in gear systems. Sharing this information organization wide can lead to more effective engine design and it could also lead to ideas for new or improved equipment.

**5. Failures of Customer Relationship Management.**

*Ans :*

- Major reason for the failure of CRM systems is the lack of understanding and preparation.
- Rely on CRM to solve business problem without first developing the business process changes and change management programs that are required.
- CRM projects implemented without the participation of the business stakeholders.

**6. Define the term decision.**

*Ans :*

Decision is the best alternative, selected from a set of alternatives. Many users make various decisions related to either their personal or business life. Some of the personal decisions include "What items are to be prepared for dinner?" "When to arrange a party?", "Which dress to wear in a party?" On the other hand, business decisions that are made on regular basis include, "Which product to launch first in the market?", "What should be the price of the product?

**7. Business intelligence.**

*Ans :*

Business intelligence (BI) is a set of theories, methodologies, architectures, and technologies that transform raw data into meaningful and useful information for business purposes. BI can handle enormous amounts of unstructured data to help identify, develop and otherwise create new opportunities.

The purpose of the BI is to improve the quality of the input for decision making. It helps the managers to understand the internal capabilities of the organization. The trends and future directions in the markets. It also tells about the behaviour of the competition.

**8. Briefly explain the various benefits of Business Intelligence.**

*Ans :*

**1. Time Savings**

One of the key advantages of Business Intelligence is that most business processes are automated, which generates important savings both in time and costs, and in turn contributes to increasing overall productivity levels.

**2. Easier and quicker access to information**

It is clear that, over the last few years, the amount of business data has propelled. Therefore, it is important that companies focus their efforts on digitizing and collecting their data via document management software. However, it is equally important that Business Intelligence tools offer easily accessible information that clearly shows the evolution of the data and, this way, allows companies to anticipate future events.

**3. Correct and relevant decisions**

In order to stand apart from the competition, reduce costs, and increase profits, a company must make intelligent decisions. To do this, these decisions must logically be based on trustworthy and relevant data, and this is exactly where traditional methods begin to fail.

**9. Define business process. Management and its purpose.**

*Ans :*

Business process management (BPM) is the discipline of improving a business process from end to end by analyzing it, modelling how it works in different scenarios, executing improvements, monitoring the improved process and continually optimizing it.

A business process is an activity or set of activities that will achieve an organizational goal. BPM is not a one-time task, but rather an ongoing activity that involves persistent process reengineering.

BPM is not a technology. It often involves using intelligent BPM approaches to automate tasks or workflow, but automation is not required.

Organizations engaged in BPM can choose to follow one of the various BPM methodologies, which include Six Sigma and lean management.

**10. State the benefits of BPM.**

*Ans :*

BPM is not a one-time task. Processes must be managed on a continuing basis. Companies should focus on improving them from start to finish and not simply look at individual tasks.

BPM helps managers in the following ways:

- understand the processes that happen within their organizations;
- analyse them from start to finish;
- continually improve processes and business strategy;
- have a greater impact on business outcomes;
- adapt business process to market trends and industry requirements; and
- capitalize on emerging technologies.

**11. Explain various types of BPM.**

*Ans :*

Various approaches to BPM offer different perspectives on business activities and what components of the business they revolve around. The three main types include the following:

**1. Systems-centric**

This type of BPM focuses on business processes that work with a business-integrated system without much human involvement. The processes often use workflow automation within a business's integrated applications. Customer relationship management applications and enterprise resource planning applications are two examples.

**2. Human-centric**

BPM can also focus on processes that people handle. These applications have features designed for human interaction, such as a well-designed user interface and notifications.

**3. Document-centric**

This approach centres on documents, such as formatting, signing and verifying contracts. Often business process management tools specialize in a specific document-centric task, such as signing.

**12. What is a computer virus.**

*Ans :*

A computer virus is a malicious program that self-replicates by copying itself to another program. In other words, the computer virus spreads by itself into other executable code or documents. The

purpose of creating a computer virus is to infect vulnerable systems, gain admin control and steal user sensitive data. Hackers design computer viruses with malicious intent and prey on online users by tricking them.

One of the ideal methods by which viruses spread is through emails – opening the attachment in the email, visiting an infected website, clicking on an executable file, or viewing an infected advertisement can cause the virus to spread to your system. Besides that, infections also spread while connecting with already infected removable storage devices, such as USB drives.

# Choose the Correct Answers

1. A _____ is a computer application used to support determinations, decisions, and courses of action in an organization or a business. [ a ]
   (a) Decision Support System(DSS) (b) Transaction Process System
   (c) Executive Support System (d) None of the above
2. A Decision Support System (DSS) is an application for information systems that helps in _____. [ c ]
   (a) System Design (b) System Analysis
   (c) Decision making (d) All of the above
3. DSS is most widely used in the _____ analysis in an organization. [ a ]
   (a) Planning (b) Support
   (c) System maintenance (d) All of the above
4. A decision support system differs from an ordinary _____. [ c ]
   (a) Operating System (b) Transaction Process System
   (b) Operational Application (d) None of the above
5. A _____ can integrate all multiple variables and produces an outcome. [ b ]
   (a) ESS (b) DSS
   (c) TPS (d) All of these
6. Which of the following is / are some of the main areas of operation of DSS. [ b ]
   (a) Transaction processing (b) Production, finance, and marketing
   (c) Executive Support System (d) None of the above
7. Which of the following is a good characteristic of a DSS? [ b ]
   (a) It has an increment model
   (b) Responds quickly to decision makers to help in decision making
   (c) Automates decision making process
   (d) None of the mentioned above
8. Which of the following is / are the components of a Decision Support System. [ d ]
   (a) Knowledge Base (b) Model Management System
   (c) User Interface (d) All of these
9. The _____ includes tools that help the end-user of a DSS to navigate through the system. [ a ]
   (a) User Interface (b) Transaction Process System
   (c) Executive Support System (d) None of the above
10. Database is just like a container which stores data in a _____ manner. [ d ]
   (a) Organized (b) Systematic
   (c) Ordered (d) All of the above

# Fill in the Blanks

1. Examples of advanced MIS are _____.
2. _____ is a management concept that integrates the management of supply chain processes.
3. _____ refers to a (generally IT based) system for managing knowledge in organizations for supporting creation, capture, storage and dissemination of information.
4. The concept of _____ management as a cooperative and collaborative process has tended to be more common.
5. _____ analytical software and databases help a company proactively identify and reward its most loyal and profitable customers to retain and expend their business
6. _____ knowledge must be modeled or represented in a way that a computer can process.
7. _____ provide support for decision-makers mainly in semi-structured and unstructured situation by bringing together human judgements and computerised information.
8. _____ is a set of theories, methodologies, architectures, and technologies that transform raw data into meaningful and useful information for business purposes.
9. BPM means _____.
10. System analysis describes _____ a system should do to meet the information needs of users.



**ANSWERS**

1. Expert Systems and Knowledge Management Systems
2. Supply chain management
3. Knowledge Management System
4. Customer Relationship
5. CRM
6. Human
7. DSS
8. Business intelligence
9. Business Process Management
10. WHAT

# One Mark Answers

**1. Supply chain management.**

*Ans :*

Supply chain management (SCM) is a management concept that integrates the manage-ment of supply chain processes.

**2. Knowledge Management System.**

*Ans :*

The term KMS can be associated to Open Source Software, and Open Standards, Open Protocols and Open Knowledge licenses, initiatives and policies.

**3. Expert System.**

*Ans :*

Expert systems are an intelligent technique for capturing tacit knowledge in a very specific and limited domain of human expertise.

**4. Decision.**

*Ans :*

Decision is the best alternative, selected from a set of alternatives.

**5. Business intelligent.**

*Ans :*

Business intelligence (BI) is a set of theories, methodologies, architectures, and technologies that transform raw data into meaningful and useful information for business purposes.

**6. Expand BPM.**

*Ans :*

Business process management.

**7. Expand BI**

*Ans :*

Business intelligence.

**8. Firewall**

*Ans :*

A firewall refers to a protection device that selectively discriminates against data flowing out or into the organisation based on the pre defined rules.

UNIT V

**COLLABORATION, IMPACT & PITFALLS IN MIS:**

Collaboration processes and information systems, Impact of Web 2.0 and social media on business process, Pitfalls in MIS Development: Fundamental Weakness, Soft Spots in Planning and Design Problems.

## 5.1 Collaboration Processes and Information Systems

**Q1. What is Collaboration ?**

*Ans :*

**Meaning**

A collaboration system is an IT-based set of software and tools designed to unify workers and/or management who are working on a related process or the same task.

It assists in uniting everyone to finish their work and meet the objectives that the process necessitates. Because a collaboration information system is a multi-user network, team members can access the part of the data required to meet a goal.

An example of a CIS may include instant messaging software that allows workers to communicate and share files that help to accomplish a task.

A digital whiteboard, or touch screen board connected to software, is also an example of a collaboration information system that helps individuals work together to complete a project.

**Q2. Explain the components of collaboration.**

*Ans :*

There are several different components of a system that values collaboration, including

**1. Data**

In this component, there are two separate types of data. Project data is all of the information generated from a specific project, such as transactions, records, or user data. If there is a recommended solution to solve a business problem, the project data would include a document that describes this solution.

Project metadata is all of the information required to handle a project. This may encompass employee schedules, to-do lists, company budgets, or management-related information. An information system can help to organize and aggregate all of the data into one location so everyone can access it when they are working on a project.

**2. Hardware**

There are various hardware tools utilized to optimize collaboration and ensure communication across multiple devices in the workplace. Examples include interactive projectors (digital whiteboards), computers, iPads, smartphones, or any other types of systems that can be touched. Maintaining these systems is essential as these are the places where data is uploaded and stored.

Because digital technologies are currently integrated into everyday objects, organizations are increasingly less focused on the hardware component of collaboration systems.

However, it is still critical to ensure proper hardware devices are employed as many digital files can be uploaded and shared with them.

**3. Software**

Different information systems remain the newest and most intuitive way to promote collaboration and knowledge-sharing. As time progresses, there are more options available for organizations that want to increase productivity and ensure projects are completed promptly.

By utilizing the software component of a collaboration system, employee morale will increase as everyone has all of the necessary information to perform their jobs. Management can gain access to these systems and use a set of KPIs to track employee productivity.

As a result, the company can streamline several areas of the organization, such as the supply chain, inventory, accounting, marketing, or customer service.

**4. Procedures**

Procedures are the various policies that dictate how a business intelligence solution will run in an organization. IT or a computer science specialist will code software to perform specific tasks to maximize efficiency and ensure everyone has access to the proper information.

It's essential to put the proper policies in place to ensure workers can collaborate effectively when completing a task. If the software systems or other tools are not functioning properly, employees will be unable to work as productively as they should.

**Examples of Frequently Used Collaboration Tools:**

- Microsoft teams
- Google docs
- Google sheets
- Skype
- Zoom
- Google Slides
- Zimbra
- Box
- Xender

**5. People**

For people to collaborate properly, they need to be able to maximize problem-solving, share knowledge, and make quick decisions. A properly functioning set of software tools can provide the assistance needed to ensure workers can carry out these functions.

Because accurate and non-duplicate data inputs are correlated to good decision-making, IT professionals have a responsibility to program software to weed out incorrect data. However, individual workers also have a responsibility to ensure their inputs are reliable to ensure collaboration efforts are streamlined.

**Q3. Collaboration is important in the work place. Discuss ?**

*Ans :* **(Imp.)**

**1. It's the foundation of all work processes**

An organization is an entity made up of a group or groups of people focused on delivering ideas, products, resources, services or solutions that deliver value to their end consumers.

**2. It's essential to overall work success**

Any organization's success is dependent on how well its employees collaborate. Collaboration is the most basic building block of teamwork and it is crucial to delivering results on projects that require teams of people working together.

**3. It's what brings teams together to achieve common goals**

Common goals define a team's role in an organization. While individuals have

responsibilities, teams have a structure that streamlines those responsibilities into output that helps them achieve their common goals.

**4. It's how teams focus on individual responsibilities**

While collaboration is an important part of getting teams and organizations to achieve their desired outcomes at work, it is also inversely true.

5. It helps drive growth and innovation Innovation has always been a core driver of growth at most organizations and collaboration is key to driving it.

**6. Improved flexibility**

As collaboration in the workplace improves, the organization's ability to handle sudden changes also improves with it.

**Q4. What are the objectives of collaborations?**

*Ans :* **(Imp.)**

**1. Product Objective: Successful Output**

The main objective of a collaboration process is successful output. For example, the assignment of a student team, planning budget or launching a new product for a business man.

**2. Team Objective: Growth in Team Capability**

The team object explains the involvement of team in achieving a task and how good the team worked together and how they supported each other. The growth in the team capability will be done when the team is permanent. As the time goes on, the relation between the team members will be improved and the output will be effective.

**3. Individual Objective: Meaningful and Satisfying Experience**

The third objective is that the meaningful and satisfying experience of the team members. Generally, the main objective of a team will be producing a successful product. The research conducted by Hackman states that if the work done by an individual member in a team is recognized then that is more meaningful. For example, if the work done by an individual is not recognized but the credits are given for the work, then the experience is considered as recognized and it is meaningful.

**Q5. Describe various types of collaborations.**

*Ans :* **(Imp.)**

Workplace collaboration can be divided into three major categories:

**1. Team Collaboration**

In team collaboration, there is a fixed group of members with clear tasks, goals, interdependencies, and timelines. In order to achieve the goals, the members have to successfully finish their interdependent tasks within the stipulated time limit.

Most team collaboration requires coordination among all the members with clear communication. An example of team collaboration can be a five-member marketing team working together to launch a new marketing campaign in a month. While each member has a separate task to perform, they are all working together to successfully launch the campaign.

**2. Community Collaboration**

In community collaboration, the goal is to learn instead of completing a task. Members join communities to share and build knowledge which they can then implement in their teams for problem-solving purposes. In case of community collaborations, the time periods are often ongoing or open. While most members have an equal footing in the community, the more experienced members may have a higher status.

Tech conferences or meetups are a great example of community collaborations where

people from different regions come together to discuss the same technical issues that they have to deal with every day.

**3. Network collaboration**

Network collaboration usually involves interactions between people who are geographically distributed and mostly working autonomously, but they all collaborate effectively in order to achieve common goals.

Most members don't know all the other members personally as this type of collaboration is driven by the internet and social media. The timelines and memberships are open and limitless. These networks help in information and knowledge capturing.

A good example of network collaborations can be groups on social media where people ask queries and other members help answer them.

**Q6. How collaboration information systems supports iterating activities in organization?**

*Ans :*

The iterating activity results the upgraded version of a product. Updating a product involves iterating the entire document, presentations, spreadsheets and other related data. The three different options of content iteration management are as follows,

**1. No Iteration Control**

Email technology is known to be the best way to iterate the content. But, there are many problems. Some of them are as follows :

(i) The email sent by one person may not be received by the other members or the team does not able to view that particular document.

(ii) The changes done by each individual will be available in different files. They all cannot be reflected in one document.

Another way to iterate the content is to share the document in a file server. Therefore, only one file can be shared among the team and the changes will be reflected in the document there itself. Suppose team members A and B downloaded the document from the server and made necessary changes. Let A replaced the document in the file server and then B replaced A's document. Therefore, the changes done by A will not be reflected in the server.

Therefore, iteration control is necessary to iterate the content.

**2. Iteration Management**

The concept of iteration management is used to track the changes made to a document. It also provides the functions and features to help saving the changes done by multiple members. There are many systems that provide iteration management. Some of them are as follows,

**(i) Google Drive**

Google drive is a free thin-client application developed by Google. It is used for sharing the document, images, audio, video etc. The maximum storage limit of Google Drive is 15GB.

The Google document can be created by simply logging on to the Gmail and choose the Drive application from the set of Google applications. Or you can simply visit the http://www.drive.google.com website. Once it is opened, user can upload variety of files like png, pdf, jpg, word, etc. The permission to access the documents available in the Google drive can be given by sharing the path/link to the selected team members using e-mail.

In this, multiple team members can access and modify the documents

simultaneously because Google combines the changes done by individual team members into a single file.

**(ii) Microsoft Skydrive**

Microsoft Skydrive is generally known as the Google drive of Microsoft. It is used to store and share various document and provides a free storage facility. It also provides various web applications such as license-free versions of Word, Excel, OneNote and PowerPoint.

The Microsoft Skydrive can be accessed by using the Microsoft account. The working of Skydrive is similar to Google Drive. The maximum storage limit of Microsoft Skydrive is 25GB.

**3. Iteration Control**

Although, the above two options provide tracking of iterated content and eliminates problems of concurrent accesses, they do not provide iteration control when the collaboration tools are limited. The different options provided by iteration control are as follows,

**(i) Permission-limited Activity**

The iteration control tool offers a set of permissions to every member of a team. And, the documents to be iterated are kept in a shared directory called as library.

**(ii) Document Checkout**

The iteration control tool offers document checkout option. The team members are given a permission that they need to check out the document before proceeding to editing. When a team member is working on document then it is not accessible by other members for editing.

## 5.2 Impact of Web 2.0 and Social Media on Business Process

**Q7. Explain the concept of Web 2.0? How it impacts in business processes.**

*Ans :* **(Imp.)**

**Definitions**

"Web 2.0 is the business revolution in the computer industry caused by the move to the internet as a platform, and any attempt to understand the rules for success on that new platform."

It's a simply improved version of the first worldwide web, characterized specifically by the change from static to dynamic or user-generated content and also the growth of social media.

The concept behind Web 2.0 refers to rich web applications, web-oriented architecture, and social web. It refer to changes in the ways web pages are designed and used by the users, without any change in any technical specifications.

**Examples of Web 2.0 Applications**

Web 2.0 examples include hosted services (Google Maps),Web applications ( Google Docs, Flickr), Video sharing sites (YouTube), wikis (MediaWiki), blogs (WordPress), social networking (Facebook), folksonomies (Delicious), Microblogging (Twitter), podcasting (Podcast Alley) & content hosting services and many more.

**Advantages of Web 2.0**

- Available at any time, any place.
- Variety of media.
- Ease of usage.
- Learners can actively be involved in knowledge building.
- Can create dynamic learning communities.
- Everybody is the author and the editor, every edit that has been made can be tracked.
- User-friendly.

- Updates in the wiki are immediate and it offers more sources for researchers.
- It provides real-time discussion.

**Impact of Web 2.0**

Adobe Flash, Microsoft Silverlight, and JavaScript are used as rich web technologies in delivering web 2.0 in addition to Ajax, RSS and Eclipse.

Its applications are based on the reorganized download methodology that made BitTorrent so fruitful that each downloader of content is also a server, sharing the workload and making the content more accessible.

It can be a powerful lure for an enterprise; with interactivity promising to fetch more employees into daily contact at a lower cost. The use of web 2.0 technologies and tools aids greater participation in projects and idea-sharing, thus ideally leading to better thought-out design and more efficient production, strengthening bonds with customers and improving communications with partners.

Web 2.0 is supposed to be more connected and intelligent with major emerging technology trends like semantic web, data mining, machine learning, natural language processing, artificial intelligence and other such technologies focused on information which is machine facilitated.

So, Web 2.0 is the idea of such a web that will store information in such a way that computers and other devices will understand on their own. FB app and Google Voice search, Apple's Siri are some of the examples of web 3.o usage.

The web as a whole can be designed more intelligently around serving a user's wants or needs. The developers and authors, singly or in collaboration, can use self-descriptions or similar techniques so that the information provided by the new context-aware program is relevant to the user.

**Q8. Explain the concept of social media impact on business processes.**

*Ans :* **(Imp.)**

Social media has had a huge impact on how businesses find and communicate with their audiences.

Prior to social media, businesses had to travel to live events to find a targeted group of prospects. Unfortunately, the average cost to attend even a small business conference comes in around $1,000, making it very difficult for startups to get in front of their target audience.

1. Allows Businesses to Become Omni-Present
2. Increases Personalization
3. Generates More Loyalty
4. Increases Industry Collaboration
5. Adds Credibility
6. Increases Referrals
7. Helps You Build a Personal Brand
8. Helps You Gauge Audience Feedback

**1. Allows Businesses to Become Omni-Present**

The average person today has about eight social media accounts (nine for people aged 16-24). If your brand is present on even a few of those platforms, you will appear to exist "everywhere" in that person's life.

You've probably heard of the rule of seven, which states that prospects need to see a brand's message seven times prior to purchasing. That number is likely much higher in 2021, as people encounter over 5,000 branding messages in a day. Therefore, social media is an amazing tool to help your brand rack up views and gain better brand awareness.

**2. Increases Personalization**

A major impact of social media in today's business world is the new level of personalization that brands can achieve: One third of marketers claim that developing a more personalized experience is a priority. Additionally, 81% of consumers appreciate brands that get to know them and understand when it is and isn't appropriate to sell to them.

With social media, it's easy to slide into your prospect's daily activities unobtrusively. That helps you develop a more personal interaction, as you can serve them ads depending on their interests and previous interactions.

**3. Generates More Loyalty**

Social media has had another positive impact on businesses: It helps them generate more loyalty.

The first way that businesses can do this is by creating their own page on one or more social networks and encouraging interaction.

Social platforms already have your customer's attention. It breaks down the barrier of trying to make them open an email or click on a link because they're already right there.

**4. Increases Industry Collaboration**

Social media can significantly impact businesses that rely on growth through collaboration.

Influencer marketing is perhaps the most common form of collaboration and is also extremely effective: 65% of marketers say that their influencer marketing budget will increase

However, social media is more than just a platform for influencer marketing. It also allows brands to frictionlessly collaborate and expand their audiences by simply sharing a post.

Without social media, collaboration is much more involved and usually requires either sending out a dedicated email to a partner's list or even hosting a webinar.

**5. Adds Credibility to Your Brand**

If someone is researching a business prior to making a purchase, one of the first places they'll probably check is the brand's social media accounts to see if they have any discounts or just to make sure that they're still active. Prospects can also see your fans and likes, which increases your business's credibility.

Seeing a business page with thousands of excellent reviews, like this one for a local sushi restaurant, gives you confidence to try them out for the first time

Social media also allows businesses to take control over reputation management. Even if you have a dissatisfied customer, potential customers can see how you respond to the situation. This is important because 30% of people view businesses that respond to online reviews in a positive light.

**6. Increases Referrals**

One of the biggest benefits of social media is that it's a virtual word-of-mouth platform. If you are like 71% of other consumers, you will buy a product based on social media referrals at some point in time. There are a number of businesses, like Dropbox and Evernote, that were built on referrals.

So how can you increase referrals? Start by offering an amazing service and make every customer a raving fan. If you already have an amazing product or service, you can leverage social media by running contests.

**7. Helps You Build a Personal Brand**

Regardless of whether your business is B2B or B2C, building a personal brand can be

valuable. In marketing, experts like Neil Patel, Rand Fishkin and Larry Kim all leverage social media to grow their brand.

**8. Helps You Gauge Audience Feedback**

After launching a new product or service, the first thing you want to know is how people perceive your new launch. Is the product easy to use? Is it missing any important features? Did you list it at a good price point?

While it's not uncommon to have complaints from people who don't even buy, social media is a great way to start a conversation with your audience and gauge their satisfaction.

## 5.3 Pitfalls in MIS Development

### 5.3.1 Fundamental Weakness

**Q9. Discuss the Pitfalls in MIS Development.**

**(OR)**

**Explain various fundamental weakness in MIS Development.**

*Ans :* **(Imp.)**

**1. Emphasis on Clerical System**

Just taking over an existing clerical system and modifying it without upgrading or changing it does not help. The clerical system has to be upgraded to a management system.

**2. Communication gap between Computer Technologist and Manager/ User**

Ensuring maximum cooperation and coordination between computer personnel and managers is necessary.

***3.* Lack of a Master Plan**

A systematic long-range plan/planned approach is necessary for establishing an effective Management Information System. Increased focus on the area of problems definition is required in the systems analysis.

**4. Sub-ordination of MIS Function to EDP Accounting System**

Management Information System's function should be made an independent function so that it reports directly to top management.

**5. Lack of Managerial Participation**

This involvement and support of top management as well as participation of all managers in the design of their own management information system are necessary. If top management tends to depend upon its informally designed private information systems, development of structured, formalised and a public management information system becomes difficult.

**6. Overlooking Human Acceptance**

Users of Management Information System should be involved right at the early stages of design. Their cooperation by demonstrating how Management Information System will positively affect their job is a must.

**7. Lack of Resources and Trained Personnel**

Lack of trained personnel consisting of system analysts, system designers, programmers and chief information officers who are business trained and/or have a basic business prospective is a handicap.

**8. Voluminous and Unstructured Nature of Data**

Sometimes the volume of data itself can be a hurdle unless careful sifting is done. On the other hand, it may also be difficult to locate and retrieve relevant data. Often, the data required by top management is unstructured, non- programmed, future oriented. inexact and external and hence difficult to capture.

**9. Limited Use of Management Science and or Techniques**

Some of the ways of increasing the effective of Management Information System include

motivating managers to participate and get involved in Management Information System, establishing consistent performance and work criteria for Management Information System, maintaining simplicity and ease of use, training systems analysts and careful consideration of basic computer feasibility criteria like volume and repetitive nature of transactions, degree of mathematical processing, quick turnaround time, accuracy and validity of data, common source documents and well understood processing logic.

**10. Enormous Time, Effort and Resources Required**

MIS budget includes data processing costs, hardware costs, personnel costs, supplies, services, etc.

### 5.3.2 Soft Spots in Planning and Design Problems

**Q10. Write about Soft Spots in Planning and Design Problems.**

*Ans :* **(Imp.)**

**1. Identify Business Needs**

When planning to acquire new systems or enhance old ones, technologists must engage stakeholders at many levels to identify execution gaps. Interview them to develop a solid set of business requirements for the analysis. With a clear understanding of business objectives and gaps across people, process or technology, the technologist has a strong foundation to build a business case for new investments. If you skip this step, getting approvals will be difficult due to lack of stakeholder support or misalignment with business objectives.

**2. Develop New Processes**

Any time you implement new technology, you're changing processes — the ways in which work gets done. Sometimes the process changes have the biggest impact; the tech is just the enabler. Identify the ultimate customer of the process (whether internal or external) and who owns the process. The customer will let you know if the process is producing satisfactory results. Then collaborate with process owners to document the process, execution gaps and proposed changes. You don't need to be a Lean Six Sigma expert to succeed — do your best to provide a complete picture of the steps, users, dependencies and reliance on technology.

**3. Develop New Skills**

Marketing leaders must proactively develop marketing competencies in alignment with organizational goals and objectives. When you receive input on business requirements, think about the skills, not just the technology, needed to meet those requirements. Create an enablement plan that addresses those skills. I talk to clients every day who have systems suffering from lack of adoption, and it's either due to underfunded enablement or training that's limited to getting users up to speed on the technology or that didn't happen at all.

**4. Manage Change**

You acquire technology to improve the organization's capabilities. But why are you making the change? How will this affect everyone in a value chain? Letting everyone know about the change is critical. Engage leaders as advocates because they understand the business objectives and are credible communicators about why change is necessary. Build a communications plan to reach all your audiences to reinforce the message and inform them of how change will happen. In particular, be clear about when the new system goes live and when old systems will be unsettled.

**5. Measure success**

Because change measurement isn't a regular practice, it often lacks the rigor used to

measure marketing campaigns and programs. However, if you want to improve your chances of getting your next proposal approved, demonstrate success by reporting the achievability of the goals of your business case and how the project met delivery milestones and user adoption goals. First determine the baseline performance metrics. Then set expectations for when you'll start reporting performance results with the executives or team that approved the investment. Follow up with periodic updates to prove you're a good steward of the organization's resources.

**Q11. Explain the design problems in MIS.**

*Ans :*

**1. Consider the Alternative Designs**

The designing team should consider numerous design ideas before starting a project. As the time goes on, these ideas should be reduced to two or three and then by the time ends the design implementation should be done by considering one effective idea. The filtering of multiple ideas will results in a good idea. This design problem can be achieved by hiring a good layout designer who has great knowledge on designing and should be able to explain the pros and cons of the selected design.

The major problem is that, sometimes the designer creates his or her own layouts which lead to the weak alternatives.

**2. Making Irrevocable Decisions**

The design of MIS should not be done by taking some difficult decisions. In doing so, the system may results in doing some irrelevant things in future. Thus, key designer and MIS development manager should be careful while taking decisions.

For instance, an alternative X is chosen then M, N, and O activities should be executed. If an alternative Y is chosen then A, B and C activities should be executed. Pursuing these branches is economically not possible to everyone. Thus, the irrevocable decisions should be taken properly.

**3. User Interface Importance**

The UI plays an important role in designing the MIS. The User interface of MIS should be easily understandable by the user. The computer experts use their own languages in designing the user interface. The usage of own languages in designing the user interface may change the meaningful dialogues. Thus, the user may confuse and can lost interface on that particular MIS. Thus, the interface should be designed carefully.

**4. The Real-world Acid Test**

Generally, the MIS is used to support the main line of a business. Thus, it should meet the practical goals of the organization.

**5. Over-automation**

The automation may not work properly in all the situations. For example, using a computer to perform some simple calculations creates complexity.

# Short Question & Answers

**1. What is Collaboration ?**

*Ans :*

**Meaning**

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*Ans :*

Adobe Flash, Microsoft Silverlight, and JavaScript are used as rich web technologies in delivering web 2.0 in addition to Ajax, RSS and Eclipse.

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# Choose the Correct Answers

I. Which of the following factor has helped spur the popularity of collaborative software for conferencing and workgroup support? [ a ]

(a) emergence of cloud networks (b) high cost of computing

(c) lowered cost of travel (d) all of the mentioned

2. Point out the wrong statement. [ a ]

(a) Yahoo's Exchange platform added features to compete with Notes

(b) SIP stands for Session Initiation Protocol

(c) Citrix GoToMeeting is one of the best-knowm collaboration software product

(d) All of the mentioned

3. Which of the following software enables real-time or near-real-time communication? [ b ]

(a) Focusw-are (b) Collaborative

(c) Cooperative (d) IMPS

4. Which of the following is first ever true collaboration platform? [ a ]

(a) Lotus Notes (b) Citrix GoToMeeting

(c) XAMPP (d) None of the mentioned

5. Which of the following is a good example of an SMS service organized into a social network and blog? [ a ]

(a) Twitter (b) Facebook

(c) Instagram (d) None of the mentioned

6. Which of the following sites let you create your own small personal Website, which you give people access to view? [ d ]

(a) Friendster (b) MySpace

(c) Facebook (d) All of the mentioned

7. Which of the following is a central element of social networking site? [ d ]

(a) Personal profile (b) Friends

(c) Groups (d) All of the mentioned

8. _____ can be defined as the data that is used to handle the project. [ c ]

(a) Project data (b) Project input

(c) Project metadata (d) All the above

9. Which of the following are the different phases involved in work flow? [ d ]

(a) Inception (b) Elaboration

(c) Construction (d) All the above

10. The content sharing in good collaboration toolset can be done by [ a ]

(a) Google drive (b) E-mail

(c) Fax (d) Social media

# Fill in the blanks

1. A _____ system is an IT-based set of software and tools designed to unify workers and/or management who are working on a related process or the same task.
2. In _____ collaboration, there is a fixed group of members with clear tasks, goals, interdependencies, and timelines.
3. In _____ collaboration, the goal is to learn instead of completing a task.
4. _____ is a free thin-client application developed by Google.
5. _____ is generally known as the Google drive of Microsoft. It is used to store and share various document and provides a free storage facility.
6. _____ is the business revolution in the computer industry caused by the move to the internet as a platform, and any attempt to understand the rules for success on that new platform.
7. A systematic _____ approach is necessary for establishing an effective Management Information System.
8. _____ includes data processing costs, hardware costs, personnel costs, supplies, services, etc.
9. Build a _____ to reach all your audiences to reinforce the message and inform them of how change will happen.
10. The Maximum storage limit of Microsoft skydrive is _____.



**ANSWESRS**

1. Collaboration
2. Team
3. Community
4. Google drive
5. Microsoft Skydrive
6. Web 2.0
7. Long-range plan/planned
8. MIS budget
9. Communications plan
10. 25 GB

# One Mark Answers

**1. Define documentation.**

*Ans :*

Documentation is the process of bridging the planning, design and implementations stages.

**2. Define workflow process.**

*Ans :*

Workflow is defined as a sequence of cohesive activities.

**3. What is Web 2.0?**

*Ans :*

Web 2.0 is a second generation World Wide Web (WWW) which is enhanced version of web 1.0. It adds new features and functionalities to the web 1.0.

**4. Define collaboration.**

*Ans :*

Collaboration can be defined as a process in which cooperative business team works together on a joint projects and assignments.

**5. Define man-month.**

*Ans :*

The man-month can be defined as a unit of calculating the work done by a person in a month.

# FACULTY OF COMMERCE

**B.Com. III Year V-Semester (CBCS) Examination**

Model Paper - I

# MANAGEMENT INFORMATION SYSTEMS

Time : 1½ Hours] [Max. Marks : 50

**PART - A (5 × 2 = 10 Marks)**

***Note :*** Answer any FIVE of the following questions.

| | | **Answer** |
|---|---|---|
| 1. | Components of MIS | **(Unit-I, SQA. 3)** |
| 2. | Define decision making. | **(Unit-I, SQA. 6)** |
| 3. | Define information systems. | **(Unit-II, SQA. 1)** |
| 4. | MRP | **(Unit-III, SQA. 10)** |
| 5. | CASE | **(Unit-III, SQA. 6)** |
| 6. | What is Knowledge Management? | **(Unit-IV, SQA. 4)** |
| 7. | Define business process. Management and its purpose. | **(Unit-IV, SQA. 9)** |
| 8. | Web 2.0 | **(Unit-V, SQA. 7)** |

**PART - B (5 × 8 = 40 Marks)**

**Note :** Answer ALL the following questions.

9. (a) Define MIS. Explain its Concept. **(Unit-I, Q.No. 1)**

OR

(b) Define decision making. Explain the process of decision making? **(Unit-I, Q.No. 14)**

10. (a) Describe the process of decision making with information system. **(Unit-II, Q.No. 7)**

OR

(b) What do you mean decision support systems (DSS)? State the characteristics of decision support systems? **(Unit-II, Q.No. 10)**

11. (a) Describe the various stages of ERP. **(Unit-III, Q.No. 12)**

OR

(b) Define the term e-Business. What are the advantages and disadvantages of e-Business. **(Unit-III, Q.No. 22)**

12. (a) What is Customer Relationship Management? **(Unit-IV, Q.No. 7)**

OR

(b) Explain briefly about Business intelligence. **(Unit-IV, Q.No. 19)**

13. (a) Explain the concept of social media impact on business processes. **(Unit-V, Q.No. 8)**

OR

(b) Write about Soft Spots in Planning and Design Problems. **(Unit-V, Q.No. 10)**

# FACULTY OF COMMERCE

## B.Com. III Year V-Semester (CBCS) Examination

Model Paper - II

# MANAGEMENT INFORMATION SYSTEMS

Time : 1½ Hours] [Max. Marks : 50

**PART - A (5 × 2 = 10 Marks)**

**Note:** Answer any FIVE of the following questions.

**Answer**

1. Importance of MIS **(Unit-I, SQA. 4)**
2. Benefits of information Systems **(Unit-I, SQA. 12)**
3. Expert Systems **(Unit-II, SQA. 5)**
4. Define E-Enterprise System **(Unit-III, SQA. 12)**
5. Define EDI **(Unit-III, SQA. 17)**
6. Supply chain management **(Unit-IV, SQA. 2)**
7. Business intelligence **(Unit-IV, SQA. 7)**
8. What is Collaboration ? **(Unit-V, SQA. 1)**

**PART - B (5 × 8 = 40 Marks)**

**Note :** Answer ALL the following questions.

9. (a) Discuss the technical and business prospective of MIS? **(Unit-I, Q.No. 7)**

OR

(b) Explain the concept of systems approach to problem solving. **(Unit-I, Q.No. 16)**

10. (a) Define Balanced MIS ? Explain the concept of efficiency and effectiveness and its impact of information technology / information systems. **(Unit-II, Q.No. 11)**

OR

(b) Explain the role of information system in business. **(Unit-II, Q.No. 3)**

11. (a) Explain the business applications of E-commerce in real world with suitable example. **(Unit-III, Q.No. 27)**

OR

(b) What are the different ERP packages? **(Unit-III, Q.No. 13)**

12. (a) Discuss the life cycle of BPM. **(Unit-IV, Q.No. 28)**

OR

(b) Discuss the stages in system development. **(Unit-IV, Q.No. 30)**

13. (a) Explain various fundamental weakness in MIS Development. **(Unit-V, Q.No. 9)**

OR

(b) Describe various types of collaborations. **(Unit-V, Q.No. 5)**

# FACULTY OF COMMERCE

## B.Com. III Year V-Semester (CBCS) Examination

Model Paper - III

# MANAGEMENT INFORMATION SYSTEMS

Time : 1½ Hours] [Max. Marks : 50

**PART - A (5 × 2 = 10 Marks)**

***Note :*** Answer any FIVE of the following questions.

**Answer**

1. Compare and Contrast data and information **(Unit-I, SQA. 11)**
2. Define MIS **(Unit-I, SQA. 1)**
3. Programmed Decision **(Unit-II, SQA. 8)**
4. Object-oriented Development **(Unit-III, SQA. 21)**
5. Data flow diagram **(Unit-III, SQA. 1)**
6. What is a computer virus. **(Unit-IV, SQA. 12)**
7. Objectives of Supply chain management. **(Unit-IV, SQA. 3)**
8. Microsoft Skydrive **(Unit-V, SQA. 6)**

**PART - B (5 × 8 = 40 Marks)**

**Note :** Answer ALL the following questions.

9. (a) Discuss in detail about structure of MIS. **(Unit-I, Q.No. 17)**

OR

(b) Briefly explain various approaches of MIS. **(Unit-I, Q.No. 9)**

10. (a) Explain the evolution of IS in detail ? **(Unit-II, Q.No. 1)**

OR

(b) What do you mean decision support systems (DSS)? State the characteristics of decision support systems? **(Unit-II, Q.No. 10)**

11. (a) Explain briefly about data flow diagram with an example. **(Unit-III, Q.No. 3)**

OR

(b) Explain some of the Emerging trends in ERP market. **(Unit-III, Q.No. 15)**

12. (a) What is supply chain management? **(Unit-IV, Q.No. 2)**

OR

(b) What is Knowledge Management System? Explain briefly. **(Unit-IV, Q.No. 6)**

13. (a) Collaboration is important in the work place. Discuss ? **(Unit-V, Q.No. 3)**

OR

(b) Explain the concept of Web 2.0? How it impacts in business processes. **(Unit-V, Q.No. 7)**