

## **Unit I**

**1**

# **An Overview of Management Information System**

### **Syllabus**

*Management information system : Concept, MIS : Definition, Role of MIS, Impact of MIS, MIS & the User. Management as a Control System : The functions of Management, Managerial Roles, The Levels of Management[R3]. MIS : A Support to the Management, Management effectiveness and MIS. Organization as a System. Decision Making, Information, Knowledge and Business intelligence, Business intelligence for MIS.*

### **Contents**

- 1.1 Management Information System
- 1.2 Management as Control Function
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- 1.4 Managerial Roles
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## 1.1 Management Information System

- MIS is a system which handles databases, process the data, provide the end user computing facilities and gives output in variety of formats. Its purpose is to meet the general information needs of all the managers in the firm. It helps manager and other users to identify and understand the problems.
- The foundation of MIS is based on basic principles of management, its practice and management control. It also relies on system theory and information technology. Various aspects of MIS are -
  - Information technology
  - Databases
  - Principles of management
  - Social sciences
  - Business goals
- Therefore MIS is a multidisciplinary approach to the business management.
- MIS is dynamic in nature i.e. it changes with time, environment and business growth.

### 1.1.1 Definitions of MIS

- Some of the selected definitions of management information systems are given below -

✓ MIS is a planned organized approach to the transferring of intelligence within an organization, for the exercise of management. They do not create information, but simply package it.

✓ MIS is an integrated user machine system for providing information to support operations, management and decision making functions in an organization. The system utilizes computer, hardware, software, manual, procedures, models for analysis, planning and control, decision making and a database.

✓ A MIS is an organized set of processes that provide information to managers to support the operations and decision making within an organization.

✓ MIS is a system that aids management in making, carrying out and controlling decisions.

✓ MIS is a set of organized procedures which when executed provides information to support decision making.

- Henry C. Lucas

### 1.1.2 Role of MIS

- Management information systems play a vital role in the successful management of systems because of following main reasons -
- ✓ Information is the common denominator underlying the management functions of planning, organizing, directing and controlling.
- ✓ Information systems are closely related to the basic system objectives, policies and strategies established by the management.
- ✓ MIS plays different roles at different levels of management i.e. provides information to the management as per the level in the organization.
- ✓ MIS provides variety of systems such as Query Systems, Analysis Systems, Modeling Systems and Decision Support Systems to cater the diverse needs of the organization.
- ✓ MIS helps in functional areas e.g. Strategic planning, management control, operational control and transaction processing.
- ✓ MIS affects the performance and productivity, which increases organizations effectiveness. It provides drastic improvements in efficiency and speed of transaction processing as well as office productivity.
- ✓ MIS involves several activities such as -
  - Collection and capturing of data
  - Data processing
  - Information reporting
  - Information communication
  - Problem solving
  - Decision support
- ✓ MIS plays significant role in product and service quality.)

### 1.1.3 Impact of MIS

- Management Information Systems have a major impact on the utilization of physical, human and financial resources of a productive system.)
- Management Information System can influence the Organization's functions, performance and productivity.)
- In any business organization all the managerial tasks in terms of functional, finance, materials, manufacturing, human resources, R & D, with a good MIS

support all the managerial tasks becomes more efficient.) With MIS tracking and monitoring of functional targets are possible.)

- An understanding of the capabilities and limitations of information system technology will enable management to direct and measure its contribution to system objectives.)
- An effective design of MIS leads to systemization of the business operations also the streamlining of business activities.)
- Because of MIS all the systems and procedures are to follow improving administration and bringing discipline in the organization.
- MIS help to achieve business objectives and goals by making business operations highly professional.)
- The impact on the managerial ability is improved as managers can use variety of tools for modeling, simulations, decision making and for experimentation purpose. This saves manager's time which can now be utilized for creative thinking and to improve the efficiency.)

## 1.2 Management as Control Function

- On the face of it, the word "control" sounds negative. It can mean restraints, constraints or checks. Within the context of organizations control involves regulation of activities and behaviours.)

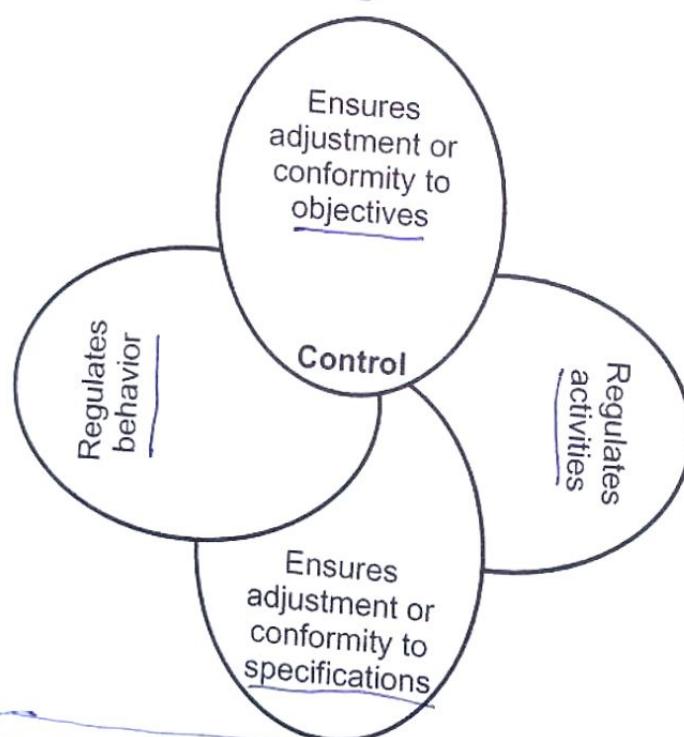


Fig. 1.2.1 The control function in management

- To control in an organizational setting, means to adjust or bring conformity to specification or objectives. In this sense, the control responsibilities of managers do involve restricting somebody's freedom. (A manager cannot control without restricting.)
- The managerial function of control comes at the end of a chain of the other major functions of planning, organizing and leading.
- If those prior functions are carried out well, generating positive responses to controls will be much easier. Conversely, if major problems exist in planning, organizing and leading, no amount of attention to control is likely to work very well. In this sense, effective control is a managerial function that depends heavily on the other functions that precede it.
- Control can also be thought of as an independent or causal, variable because the results of control efforts improve the planning process of the organization. Control is thus part of a feedback loop into planning and organizing that can help managers adapt to changing circumstances and conditions.

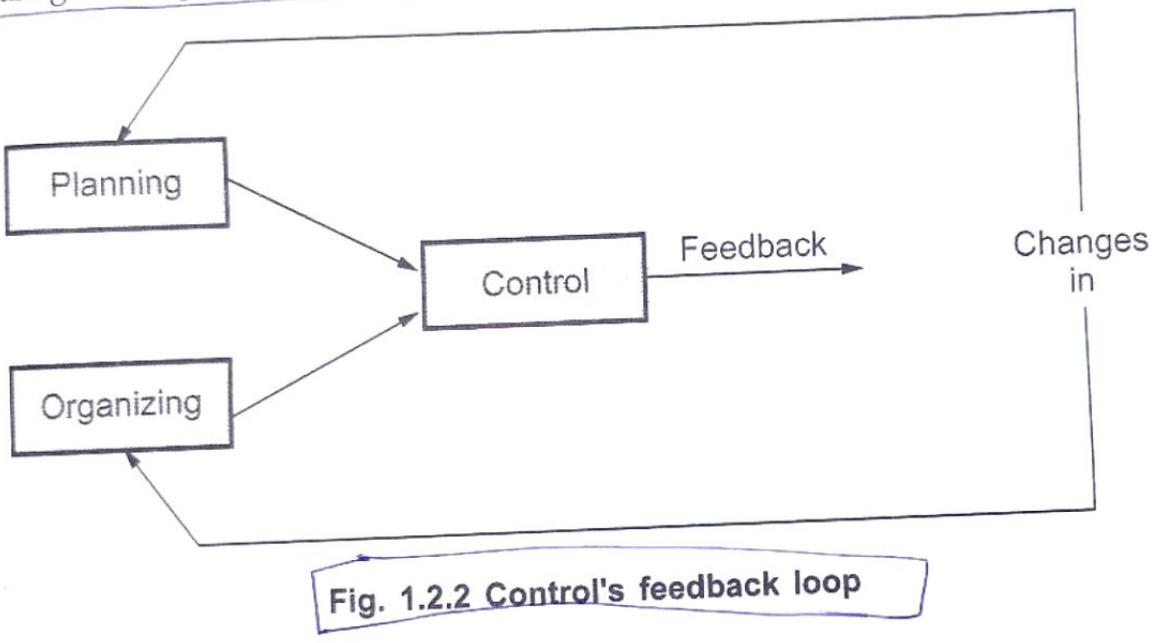


Fig. 1.2.2 Control's feedback loop

## 1.2.1 Principles of Control

- For control process to be very effective it must be governed by firm principles. Following are some important principles :
  - A method of control must be suitable for the activity.
  - The controls installed should not cost more than they will actually save.
  - The type of industry or activity concerned must determine what types of controls are needed.
  - Feedback information must be available to the controller in time for corrective action to be taken before matters go too far wrong.

- e) It is essential that corrective action be taken promptly and consistently required.
- f) The exception principle should be applied wherever possible.
- g) Areas of accountability and authority should be clearly defined so that there is no doubt where the responsibility lies for the various control activities.

### **1.2.2 Requirements of Effective Control**

- All managers want to have effective control over organization. In order to make controls effective and efficient, the control must be tailor made to suit the following -
  - ✓ 1. Tailoring controls to plans and positions.
  - ✓ 2. Tailoring controls to individual managers.
  - ✓ 3. Exceptions at critical points.
  - ✓ 4. Objectivity of controls.
  - ✓ 5. Fitting the control to organizational climate.
  - ✓ 6. Economy of control.
  - ✓ 7. Control leading corrective actions.

#### **1. Tailoring controls to plans and positions**

- Control should reflect the plans for which it has been designed. Also it should reflect the positions in the organization structure where responsibility of action lies.

#### **2. Tailoring controls to individual managers**

- Control system should be designed to help individual managers in carrying out their function of control.

#### **3. Exceptions of critical points**

- Control system should concentrate on exceptions from planned performance to increase their effectiveness and efficiency.

#### **4. Objectivity of controls**

- Effective control requires objective, accurate and suitable standards.

#### **5. Fitting of controls to organization**

- The control system or technique must be suited to organizational climate and work culture.

#### **6. Economy of control**

- Control system should bring out deviations from plans with the minimum of cost.

### • Controls leading to corrective action

- Controls must lead to corrective action.

## 1.3 Functions of Management

- The important management functions can be categorised into four major functions. These are planning, organizing, leading and controlling as shown in Fig. 1.3.1.

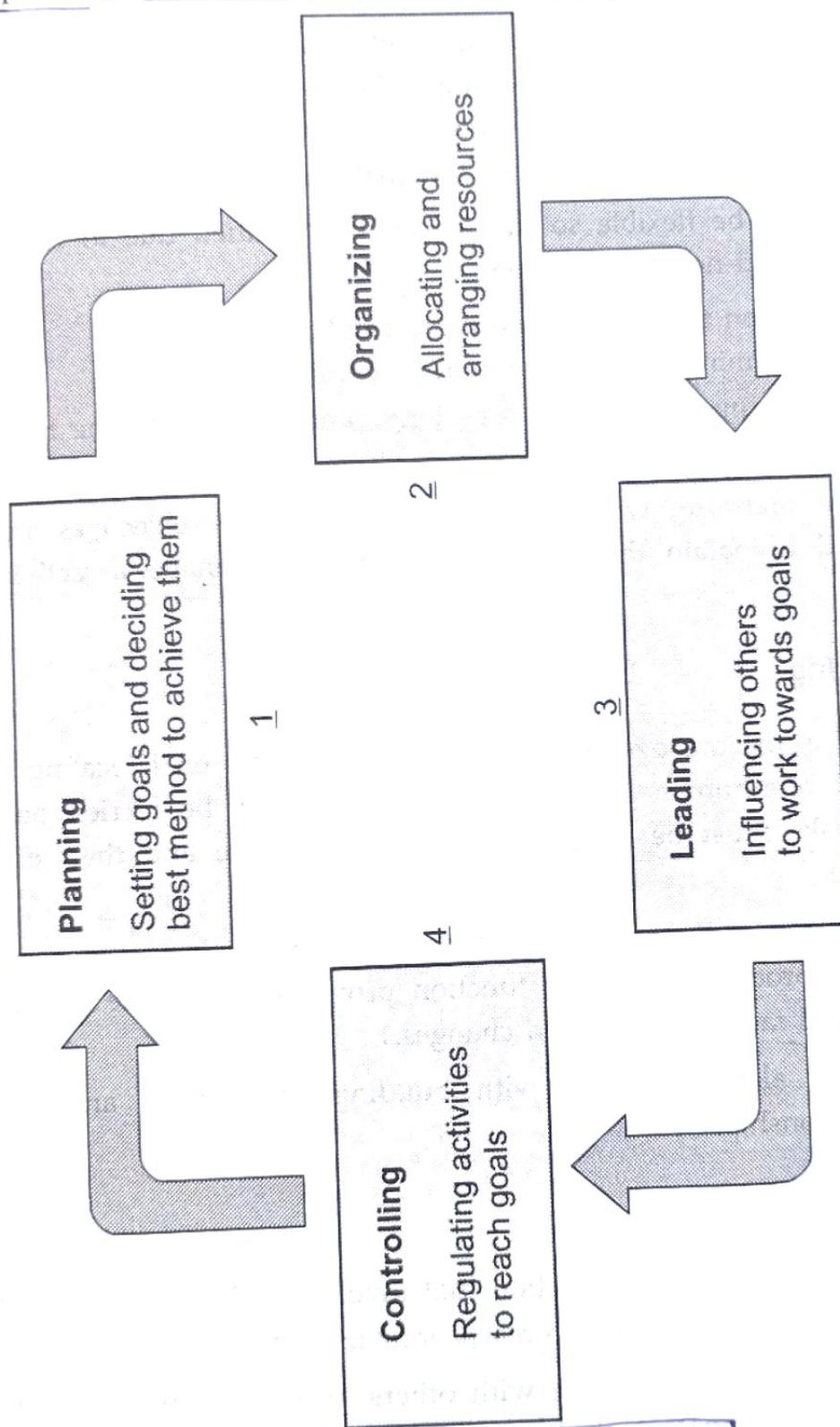


Fig. 1.3.1 Functions of management

### 1.3.1 Planning

- ✓ Planning is the management function that involves setting of goals and deciding the best method to achieve them.
- ✓ Planning is most important and basic activity of management. The function also includes considering what must be done to encourage necessary levels of change and innovation.
- ✓ Planning provides a basis for the other major functions of management organizing, leading and controlling. Manager with his subordinates sets the required goals, establishes the policies, standard methods, develops program strategies and schedules to achieve the goals.
- ✓ The plan must be flexible so that it can be modified due to change in working environment and new information.
- ✓ Based on function there exists two types of planning
  - a) Strategic planning      b) Operational planning
- Strategic planning which addresses long range goals and the broad approaches for achieving them.)
- Operational planning which focuses on short range objectives and the specific means used to obtain them and on the related managerial activity of decision making.)

### 1.3.2 Organizing

- ✓ Organizing is the management function that focusses on allocating and arranging human and non-human resources so that plans can be carried out successfully. Different tasks must be assigned to different people and their efforts must be co-ordinated.)
- This involves co-ordination of tasks and the various ways to accomplish it.) In management process organizing function provides a valuable tool for promoting innovation and facilitating needed changes.)
- Organizing is also concerned with building, developing and maintaining of working relationships.)

### 1.3.3 Leading

- Leading is the management function that involves influencing others to engage in the work behaviours necessary to reach organizational goals.)
- Leading includes communicating with others, providing direction and motivating people.) This function also includes encouraging the necessary levels of change and

innovation. In the process of leading, a manager strives to match the need of the people with the objectives of the company.)

- ✓ A leader must also recognize the need for co-operation and combined efforts for survival and growth of the firm. Hence a leader maintains good balance between individual motivation and co-operative efficiency.

### 1.3.4 Controlling

- **Controlling** is the management function aimed at regulating organizational activities so that actual performance meets the expected objectives and standards of company.
- For regulating organizational activity manager's need to monitor ongoing activity, compare the results with standards and take the necessary corrective action.

### 1.4 Managerial Roles

- Henry Mintzberg's study focussed on top-level managers categorized the manager's various activities into roles. Mintzberg's findings are applicable for wide variety of managers.
- A role is an organized set of behaviours associated with a particular position. The positions usually make necessary multiple roles e.g. roles for a sales person position in a general store might include information giver, stock handler and cash collection.
- The three general types of roles that Mintzberg observed are :
  1. Interpersonal roles
  2. Information roles
  3. Decisional roles.
- Mintzberg's categorization of managerial activities into role provides some insight into what managers actually do during their work. The roles also tell about the types of skills that a manager requires to carry out their work effectively. Fig. 1.4.1 shows various managerial roles.
- Mintzberg's role approach provides some what different view on management than the four management functions. At first glance it might seem that the Mintzberg's findings are incompatible with the view that planning, organizing, leading and controlling are important parts management process.
- Mintzberg study did not consider why managers were engaging in the different roles. When the why is taken into consideration, it becomes clear that the functions of management provide important guidelines to achieve goals.

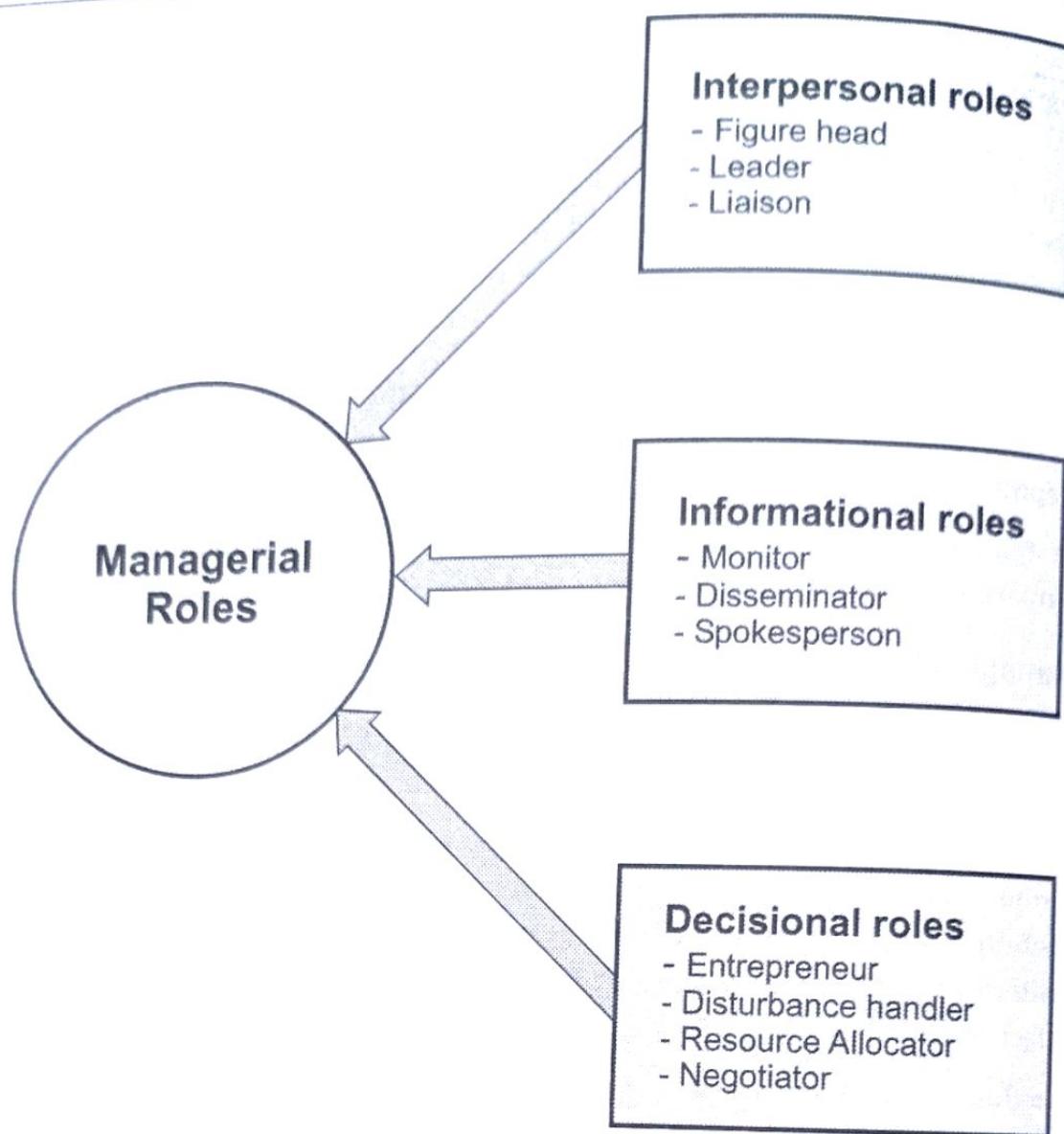


Fig. 1.4.1 Managerial roles

### 1.4.1 Interpersonal Role

- The interpersonal role grows directly out of the authority of a manager's position and involves developing and maintaining positive relationships with others.
- The interpersonal roles of manager include :
  - i) Figurehead role
  - ii) Leader role
  - iii) Liaison role.

#### i) Figurehead role

- Being managers as head of organization in figurehead role, manager performs symbolic or ceremonial duties of either social or legal nature. This includes greeting job candidates, present awards and entertain dignitaries. Presiding at a farewell reception for a departing employee. Managers spend 10 - 12 percent of their time in this role.

**Leader role**

- In leader role, manager builds relationship with subordinates also communicates, motivates and train the employees.

**Liaison role**

- In liaison role, manager maintains networks of contacts outside work unit who provide help and information.
- These contacts include not only other managers within the organization but also many individuals outside it for example customers, suppliers, government officials and managers from other organizations.
- This role also emphasizes lateral interactions as contrasted with vertical interpersonal interactions of a manager and it highlights the fact that an important part of a manager's job is to serve as a go between his or her own unit and other units or groups.

**1.4.2 Informational Role**

- Informational role pertains to receiving and transmitting information from staff members. Mintzberg observed that a large part of the manager's job is devoted to informational roles, in which the manager acquires, processes and communicates information.
- The informational role includes - monitor role, disseminator role, spokesperson role.

**i) Monitor role**

- In monitor role, manager monitors or scans the source of information environment. Manager collects internal and external information about issues that can affect organization. They also talk with people they meet in their liaison roles. This information gathering role in the monitor role.

**ii) Disseminator role**

- In disseminator role, manager passes certain information to peers and subordinates that is obtained from either internal or external sources.

**iii) Spokesperson role**

- In spokesperson role, manager provides information about the organization to external community such as press, TV, suppliers and to government officials. For top managers, this information role is a key part of their regular management duties as they interact with government officials, consumer groups, and other people who have an influence on or interest in the organization.

### 1.4.3 Decisional Role

- In decisional role the managers examine alternatives and then make choices commitments. These decisions range from minor choices that affect only a few people to major strategic decisions that can affect the entire organization.
- Mintzberg identified four decisional roles : Entrepreneur, disturbance handler, resource allocator and negotiator.

#### i) Entrepreneur role

- In entrepreneur role, manager acts as initiator, designer and encourages change and innovation to improve.
- Managers not only make routine decisions in their jobs but also frequently make decisions that explore new opportunities or start new projects. Such entrepreneurial behaviour within an organization often involves a series of small decisions that permit ongoing assessment about whether to continue or abandon new ventures.
- A manager is constantly looking for new ideas or initiates new ideas, and observes multiple activities at any time. This involves new products, new processes or solutions to problems.

#### ii) Disturbance handler role

- In disturbance handler role, manager takes corrective action when organization faces important, unexpected difficulties.
- Manager has to settle the disputes which affect the company's functioning. The disputes can be of any type either internal or external. Such as cancellation of order, violation of standards, strikes or any misconception.

#### iii) Resource allocator role

- In resource allocator role, manager distributes resources of all types including time, funding, equipment and human resources.
- Manager as a resource allocator has to decide spendings on recruitment, training, development and on advertisements.

#### iv) Negotiator role

- In negotiator role, manager represents the organization in major negotiations affecting the manager's areas of responsibility.
- Manager as a negotiator can bargain with vendors on behalf of organization and can finalize the deal to the favourable conditions.

Mintzberg's 10 managerial roles are summarized along with their descriptions in Table 1.4.1.

<b>Figurehead Role</b>		
1	Figurehead	Performs symbolic or ceremonial duties
2	Leader	Builds and maintains relationships, communicates, motivates subordinates
3	Liaison	Maintains networks of contacts outside the company who provide information and help
<b>Information Handler Role</b>		
1	Monitor	Monitors the source of information about the issues that can affect the organization
2	Disseminator	Passes certain information to peers and subordinates.
3	Spokesperson	Provides information about the organization to outsiders.
<b>Entrepreneur Role</b>		
1	Entrepreneur	As initiator, designer and encourager of change and innovation.
2	Disturbance Handler	Take corrective action in disputes or malfunctioning
3	Resource Allocator	Distribute resources of all types e.g. Fund, equipment, human resource
4	Negotiator	Negotiates on behalf of company.

Table 1.4.1 Mintzberg's 10 managerial roles

## 1.5 Management Levels

- Managers can be differentiated on the basis of their organizational position and responsibilities. They can be classified as
  - Top management level
  - Middle management level
  - Front line management
- Fig. 1.5.1 shows types of managers by hierarchical level within the organizational pyramid as top management, middle management and first-line management.

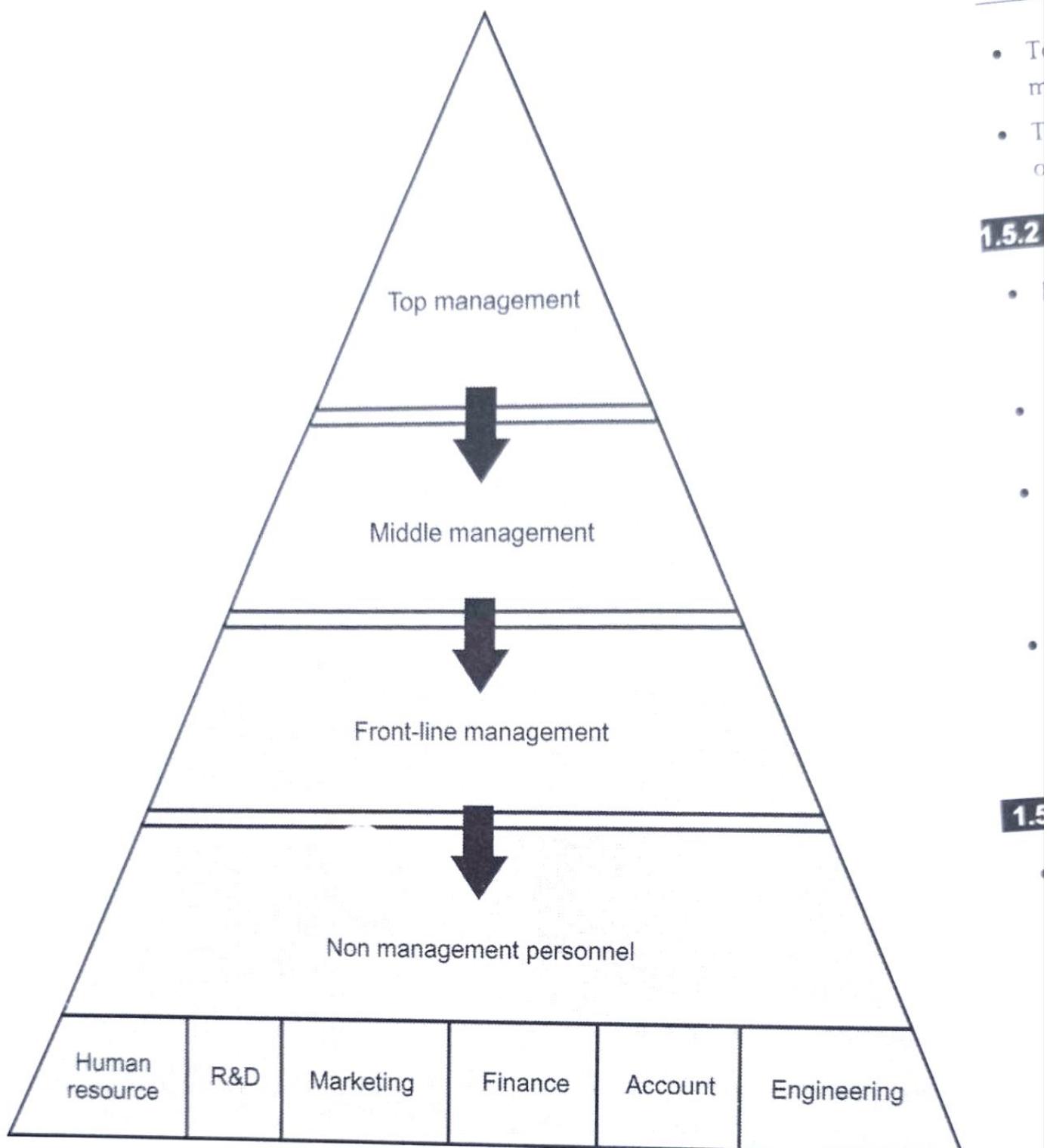


Fig. 1.5.1 Levels of management

### 1.5.1 Top Management

- **Top managers** are managers at the very top levels of the hierarchy who are ultimately responsible for the entire organization. They are very few in numbers and the typical titles of top managers include "chief executive officer (CEO)", "president", "executive vice president", "executive director", "Senior vice president".

- Top managers have direct responsibility for the upper layer of the middle management directly below them in hierarchy or organization.
- Top managers observe the overall planning for the organization and maintain overall control over the progress of the organization.

### 1.5.2 Middle Management

- Managers who execute the strategies established by top management and who supervise and co-ordinate the activities of first-line managers is called the middle managers.
- Many different titles are used for middle managers including "manager", "director" "chief", "departmental head", "division head".
- Middle managers perform a delicate balancing act because they are in the middle between the demands of top managers and the needs of first-line managers. Middle managers are mainly responsible for implementing overall organizational plans so that organizational goals are achieved as expected.
- In very large organizations middle management includes more than one levels. Many companies cut the number of managerial levels in an attempt to lower the costs, facilitate communication and to reduce the layers involved in decision making.

### 1.5.3 Front-line Management

- Managers at the lowest level of hierarchy who supervise and co-ordinate the work of operating (non-managerial) employees are **front-line managers**.
- Front-line managers often have titles like "Supervisor", "Manager", or Foreman.
- Front-line managers oversee groups of people who produce the goods or services provided by the organization. They are extremely important to the success of an organization because they are involved in the day-to-day operations and are closest to the actual operations of the organizations also they are responsible for smooth functioning of the organization.
- Front-line managers operate at the interface between management and the work force of the organization. They represent management to the workers, and in reverse fashion. They represent workers to management frequently. Workers perceive and judge management through their supervisors and upper management gauges the work force primarily through supervisors.
- Front-line managers are responsible for directing the work of subordinates. Their jobs may vary widely, depending on the structure of the organization and their level within the firm.

- The important characteristics of front-line managers are - leader, motivator, decision maker, co-ordinator, counselor, communicator and trainer.

## 1.6 MIS as a Tool for Management Process

- Decision making is an important aspect of management in managing the activities of an organization. The quality of decisions made by managers depends upon their intelligence i.e. the ability to retrieve and understand knowledge. Information which compiled becomes knowledge and thus reduces uncertainty in decision making for executing any plan a lot of information and data is required.
- Feedback and control are incorporated to improve the overall performance. To decide the line of action summary of individual subsystems are collected in the form of reports. The drawback or weaknesses in subsystem or department can be identified from the information reports.
- These information reports must be designed to provide adequate information. A good information report improves analytical abilities leads to better business judgement.
- A well designed MIS must furnish information to the managers to expand their knowledge base.
- MIS is planning and control tool for a manager for successful operations and expertise. It facilitate the decision making at all levels of management with accurate, timely information, which permits optimum decision making.
- An MIS is a comprehensive and co-ordinated set of information subsystems to enhance productivity in conformance with manager's styles and characteristics. MIS is a powerful tool for budgeting, forecasting, modelling, project planning and control, diversification.

## 1.7 MIS as a Support to Management

- Management information systems are designed to support various management activities. Managers plan, direct, staff, organize and control the major activities of an organization. Decision making is a major requirement of each of those managerial functions.

- MIS is a facilitating system for managers in developing decisions. The decisions required in the management function are shown in Table 1.7.1.

Sr. No.	Management functions	Decision required
1.	Planning	<ul style="list-style-type: none"><li>• Strategic planning</li><li>• Resource requirement</li><li>• Deployment of resources</li><li>• Methods and procedures</li></ul>
2.	Organizing	<ul style="list-style-type: none"><li>• Goals</li><li>• Policies</li><li>• Guidelines</li><li>• Authority</li></ul>
3.	Staffing	<ul style="list-style-type: none"><li>• Manpower planning</li><li>• Selection, training, deputation</li><li>• Promotion, transfer</li></ul>
4.	Directing	<ul style="list-style-type: none"><li>• Appropriate manpower</li><li>• Techniques</li><li>• Orientation</li></ul>
5.	Co-ordinating	<ul style="list-style-type: none"><li>• Tools</li><li>• Methodology</li><li>• Sequencing</li></ul>
6.	Controlling	<ul style="list-style-type: none"><li>• Product policy</li><li>• Manufacturing plans</li><li>• Capital policies</li></ul>

**Table 1.7.1 Management decisions**

- Fig. 1.7.1 shows the support of MIS to the management functions.
- MIS helps to achieve business goals of an organization efficiently and effectively. Also it helps to execute all business operations smoothly.

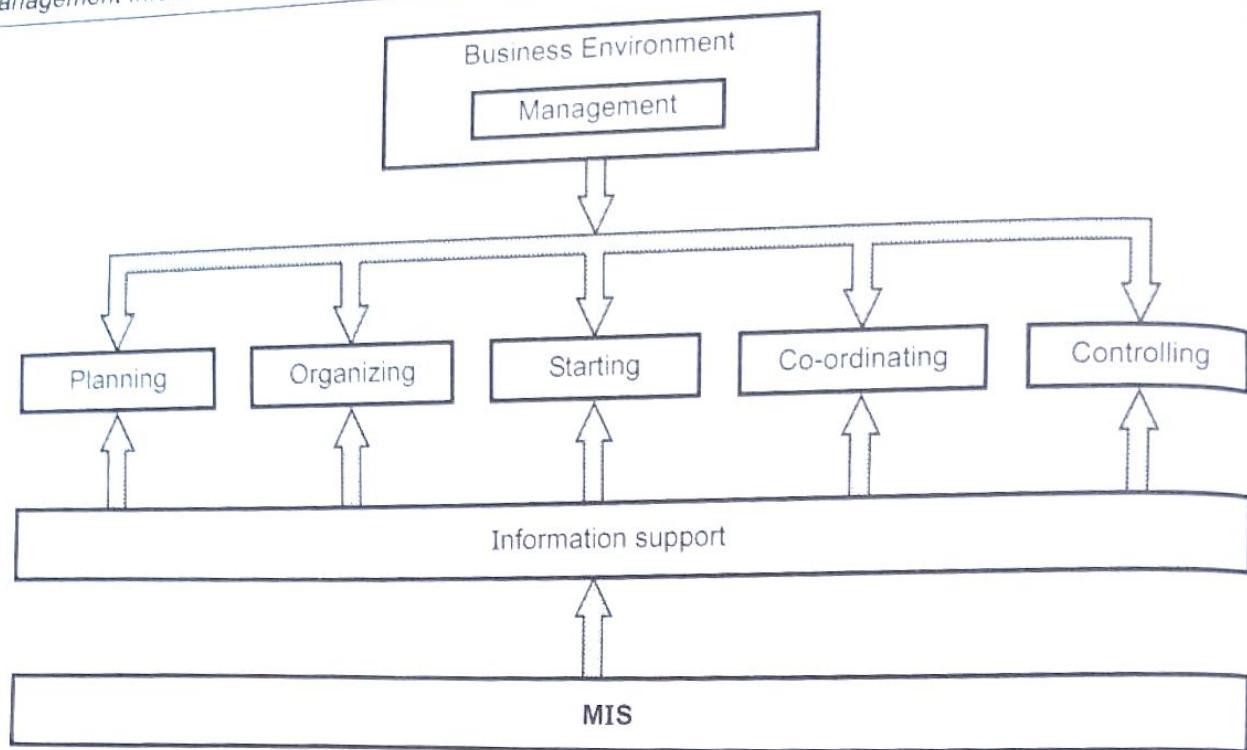


Fig. 1.7.1 MIS support to management function

### 1.7.1 Organization as a System

- The individual needs and organizational objectives are two different things. When both those factors are congruent (having same nature size and shape). There is high level of performance and job satisfaction. But when individual needs and organizational objectives are not congruent there will be poor performance dissatisfaction can result. It is the information system which can alter the relationship between individual needs and organizational objectives.
- The **Leavitt model** of organizational subsystem describes an approach to viewing organizations. From both the individual and overall organizational perspective Leavitt model is known as **Socio-technical** system with four interrelated components, these are -
  1. Task            2. Technology
  3. Structure      4. People
- Now, a fifth element called organizational culture is added to the Leavitt model and modified model of organizational systems shows all five components interrelated with each other in Fig. 1.7.2.
- Since all the components are interrelated with each other (inter dependence) change in any one components affects on other components also. The organization continuously exchanges the information with the environment and is influenced by the changes in it. Hence, the organization must change with the environment to achieve the objectives.



Fig. 1.7.2 Modified organization system model

- To socio-technical design focuses on human as well as technical and organizational objectives in effecting organizational change. The design procedure for information system requirements is shown in Fig. 1.7.3.

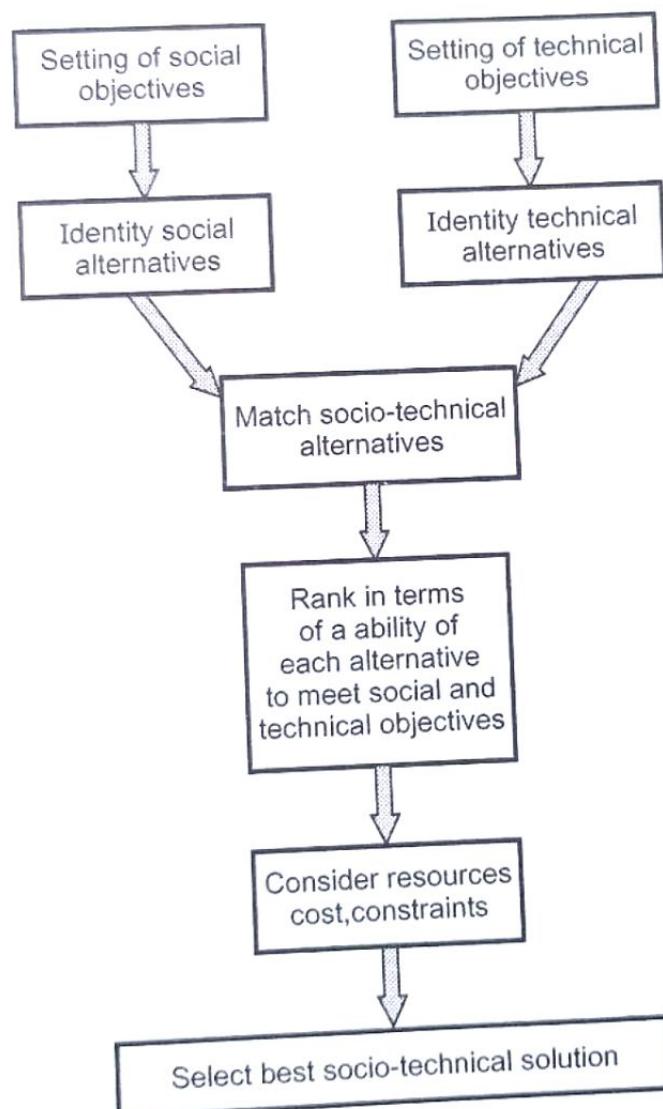


Fig. 1.7.3 Socio - technical system design

- Due to change in environment and people system and its goals are also changing. Another reason for goal change is because of different phases of growth cycle. All organizations and their business passes through four phases of growth cycle as shown in Fig. 1.7.4.

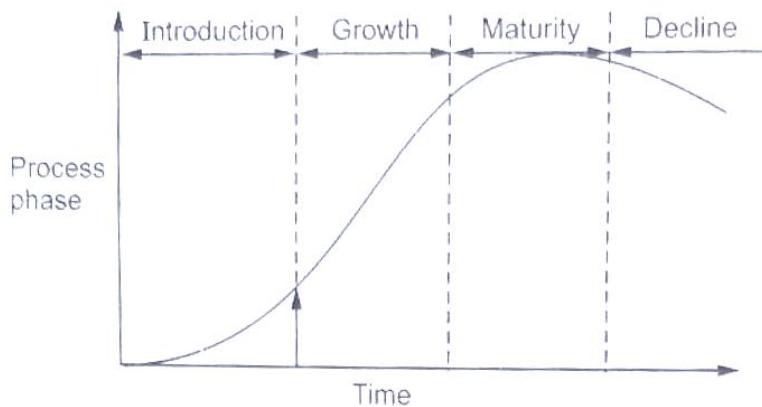


Fig. 1.7.4 Business growth cycle

- Each phase generates new goals to achieve. If organization does not changes the goals, the starts decaying.

## 1.8 MIS for Business Planning

- Continuous changing business environment makes business planning complex. Important factors like market forces, technological change and competition makes significant impact on the business revenue. MIS helps to assess and monitor these factor and provide information to the management for strategy formulation.
- MIS provide the relevant information to the management Depending on the current status of the business, suitable type of Strategy is chosen. MIS gives the present business status whether business is on growth path or is stagnant or it is declining and reasons of it.
- MIS continuously assess sales, market, quality and profit of business. Mix strategy at different levels of management is necessary for surviving a business. When business is on growth path, mix strategy of price, product and market is chosen. When it is declining, mix strategy of pricing discount, sales promotion and advertising strategies are chosen.
- MIS focus on different aspects of business, as per the status of business focus shifts from one aspect to other. In introductory phase focus is on product designing and on maturing of business the focus should be on post sales service and support. MIS provide the information on resources, costs, quality and availability so that the cost effective mix of resources can be deployed.
- MIS has various models to help the business organization in Strategic planning
  1. Forecasting model for investing future.

- 2. Business model for evaluating strategy performance.
- 3. Functional model for new product launching, budgeting.
- 4. PERT/CPM model for project planning.
- Fig. 1.8.1 illustrates MIS for planning and control process.

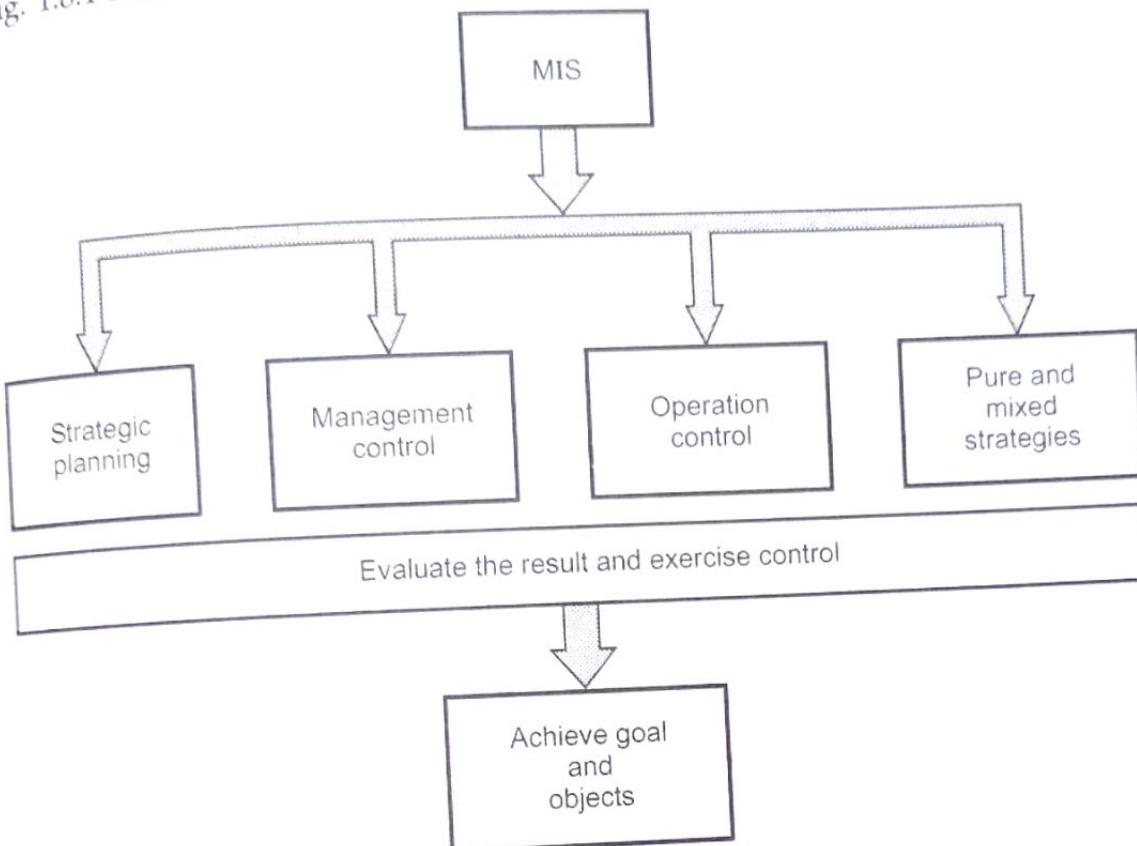


Fig. 1.8.1 MIS for planning and control process

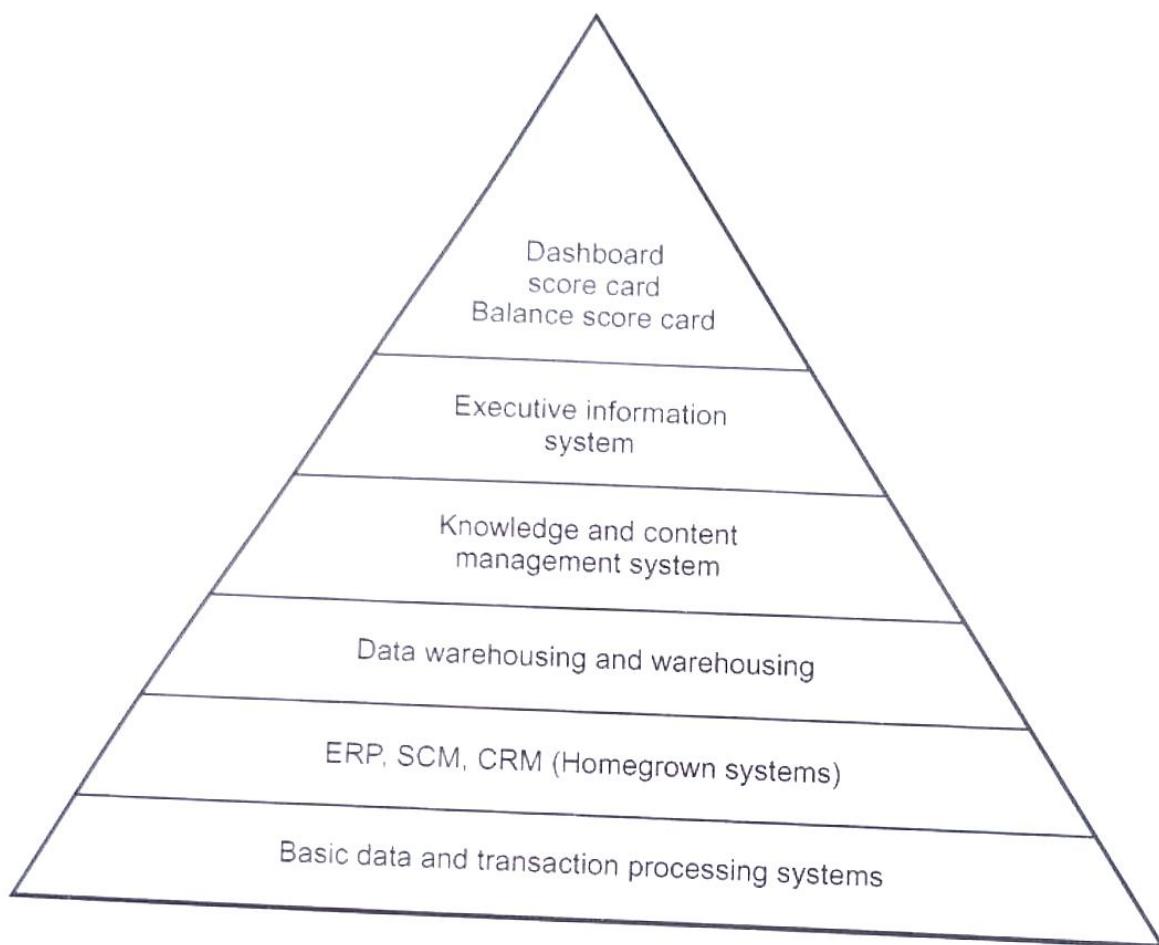
### 1.8.1 Role of MIS in Top Management Functions

- In deciding the goals and objectives.
- In determining status of business.
- To provide the correct focus of action.
- To determine mix of strategies.
- In evaluating performance of strategies and to provide feedback.
- In cost-benefit evaluation.
- In mobilizing resources and mix of resources.

### 1.9 Strategic Design of MIS

- The strategic design of MIS operates over conventional MIS model. The strategic MIS generates reports on comparison of budget and throws light on level of achievement.

- The objectives of strategic design of MIS is to widen the scope and support strategy management of business. The strategic decision of MIS helps to
  - Provide a measure of business operations parameters.
  - Provide a measure of business performance parameters.
  - Identify non performing areas.
  - Identify the cause of problems inhibiting the performance.
  - Support in strategic, managerial and operational decisions.
  - Build knowledge and business intelligence in strategy formulations.
- The model for strategic design of MIS is shown in Fig. 1.9.1.

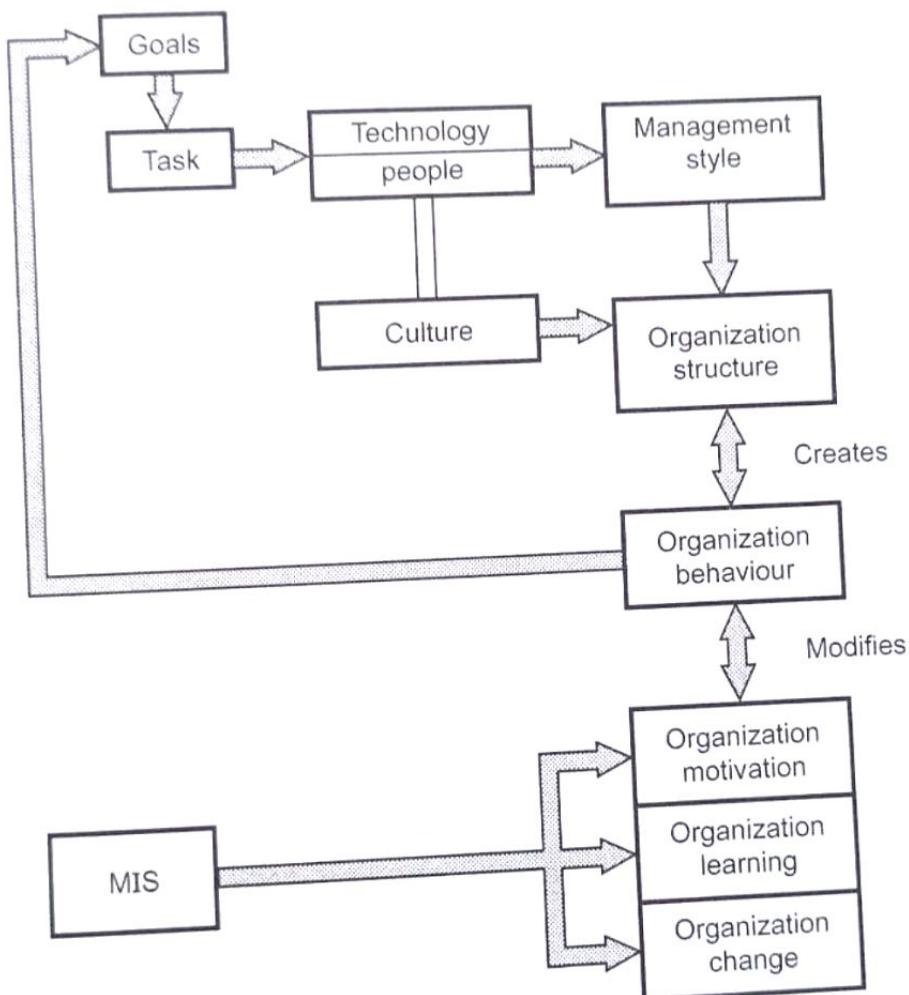


**Fig. 1.9.1 Strategic design of MIS**

## 1.10 MIS Organization

- Management theory and socio-technical theory are used for designing an information system. Information system leads to high degree of centralization. Access to relevant information allows higher management to handle wide range of problems, thus retaining centralized control of decision making. Here the MIS will have functional design with information supporting to functional head.

- If the organization follows rules, policies, system and procedures the MIS must incorporate those features. MIS is designed as project or product organization system if the basic model is like project organization.
- MIS should support the organizations culture i.e. efficiency, delegation of power and authority. In case of open systems an indication of prior warning should be given to the decision maker. When the organization is dynamic, the MIS must play dynamic role.
- To make up the behaviour of organization the organizational learning is very useful. The MIS must support the learning mechanisms, keep the records of action, build various decision models, co-ordinate lateral activities. Fig. 1.10.1 indicates the relationship of MIS on the organizational behaviour.



**Fig. 1.10.1 Organization behaviour and MIS**

## 1.11 Decision Making

### 1.11.1 Characteristics of Business Decision Making

1. The business decision making is sequential in nature.
2. Decision making is a complex process due to risks and trade offs.
3. Decision making is influenced by personal values of decision maker.
4. Decision making requires creativity imagination and deep understanding of human behaviour.

### 1.11.2 Factors Affecting the Rational Decision Making

- Following factors affect the rational decision making of managers.

#### i) Inadequate information

Decision makers may have inadequate information about the problem, possible alternatives and their strengths and limitations.

#### ii) Time and cost

Time and cost are the limiting constraints throughout the decision making process.

#### iii) Perception of decision maker

Decision maker's perception in identifying the problem, selecting alternative may ignore the actual critical problem.

#### iv) Experience of decision maker

If decisions are to be taken with less information then extensive experience with situation becomes the key input. The experience level of the decision maker becomes the key factor.

#### v) Decision maker's personality

The perfectionist decision maker may postpone taking decision, preferring to seek the ideal alternative.

The impulsive decision maker might hurry through the decision process thinking that just to finish it at the earliest.

Such personalities give negative effect of decision maker.

**vii) Values of decision maker**

A decision maker must not reflect his own personal values rather than company's need or the personal values must not influence both the goals and the results of decision process.

**viii) Capacity of decision maker**

Even after gathering perfect information, it is the intelligence and calculating capacity of manager which limits the success of any plan or decision.

**1.11.3 Model of Decision Making**

- According to Herbert Simon and Mintzberg decision making model involves three phases. The three phases are -
  1. Intelligence
  2. Design
  3. Choice

**b) 1. Intelligence**

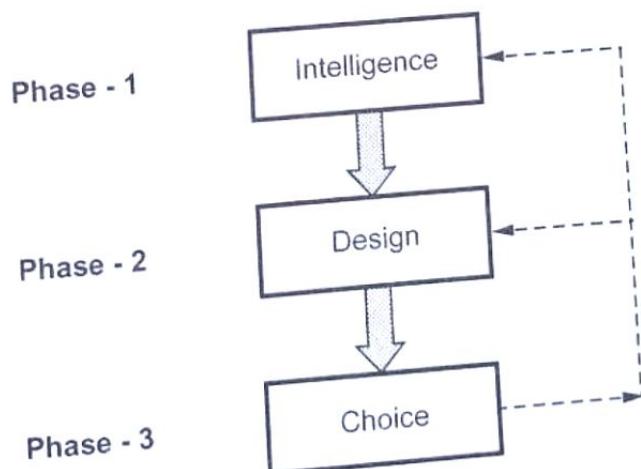
- In the first phase of decision making model, the decision maker identifies the problem and the conditions calling for a decision. The decision maker either reacts to the problem or examine the opportunities.

**2. Design**

- Design is the second phase of decision making. In this phase, decision maker develops and analyzes alternative courses of action by analyzing different alternatives. The feasibility of the decision is also tested. Depending on the problem either a ready-made alternative or a custom-made solution is developed.

**3. Choice**

- Out of different suitable alternatives, based on certain criteria best alternative is selected as a decision. For choosing a best option, the decision maker again considers the design and intelligence phase. Fig. 1.11.1 shows model of decision making.



**Fig. 1.11.1 Model of decision making**

#### 1.11.4 Decision Making Systems

- There are two types of decision making systems based on manager's knowledge about the environment. These are
  1. Closed decision making system.
  2. Open decision making system.

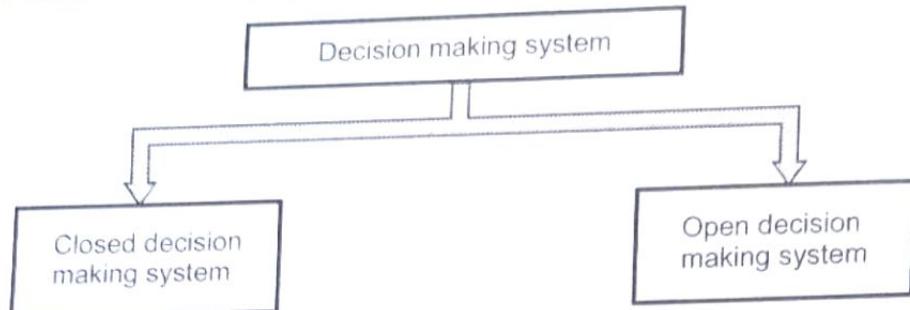


Fig. 1.11.2

##### 1. Closed Decision - Making Systems

- When the manager operates in a known environment it is called as closed decision making system

##### Conditions of closed decision - making system

1. Manager has a predetermined alternatives and the outcomes of that decision are known.
2. Manager has a method where different decision alternatives are generated, tested and ranked for selection.
3. Based on goal or objective, manager selects one of the alternatives.

##### 2. Open Decision - Making System

- When the manager operates in an environment not known to him, then it is called as open decision making system.

##### Conditions of open decision - making system

1. Manager does not know all decision alternatives.
2. The outcome of decision is not known.
3. No method or rule is available to study various alternatives.
4. Manager selects an alternative where his desires are met.

#### 1.11.4.1 Nature of Decision

Most business decisions can be divided into two basic types, these are

1. Programmed decisions and
2. Nonprogrammed decisions, as shown in Fig. 1.11.3.

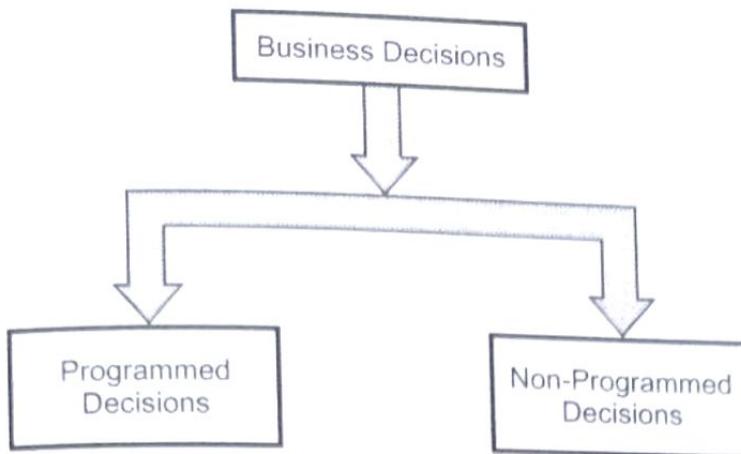


Fig. 1.11.3 Decision types

### Programmed Decision

- Programmed decision is a standard response to a simple or routine problem. The nature of the problem is well defined and clearly understood by the decision maker as is the array of possible solutions. Examples of programmed decisions can be seen in college admission decision, reimbursement of manager's travel expenses and promotion decisions with many personals. In all these decisions specific criteria can be identified.
- The programmed decision process is characterized by high levels of certainty for both the problem formulation and the problem solution phases and rules and procedures typically spell out exactly how to respond.

### Nonprogrammed Decision

- Nonprogrammed decision occur in response to problems that are either poorly defined or novel. For example, should a company president with limited funds expand the facilities to bring in more research contacts ? No alternative is clearly correct and past decisions are of little help, instead you must weigh the alternatives and their consequences carefully to make a unique decision i.e. a nonprogrammed decision.
- In most organizations a significant relationship exists between the programmed and nonprogrammed decision and organizational hierarchy, for example top managers usually face nonprogrammed decisions, as in the case of the managing director. On the other hand department heads rarely make such decisions. Further more, lower level managers typically encounter mostly programmed or routine decision. Their options and resources as well as risks are usually far less than those of top managers. And as we might expect middle managers fall somewhere in between.

### 1.11.5 Influences on Decision Making

- At least three general factors influence decisions. First there are the characteristics of the decision maker. Such factors as his or her knowledge regarding the problem, ability to analyze and solve the problem and motivation to solve it, affects the decision.
- Second are the characteristics of the problem itself including the extent to which the problem is familiar to the managers, the ambiguity and complexity of the problem, and the extent to which the problem is stable or volatile.
- Third, the decision is influenced by the environment in which the decision is irreversible, its significance or importance, the person accountable for the decision and its consequences, and any time or money constraints involved in the decision process. Taken together, these factors represent the major ingredients involved in the decision.

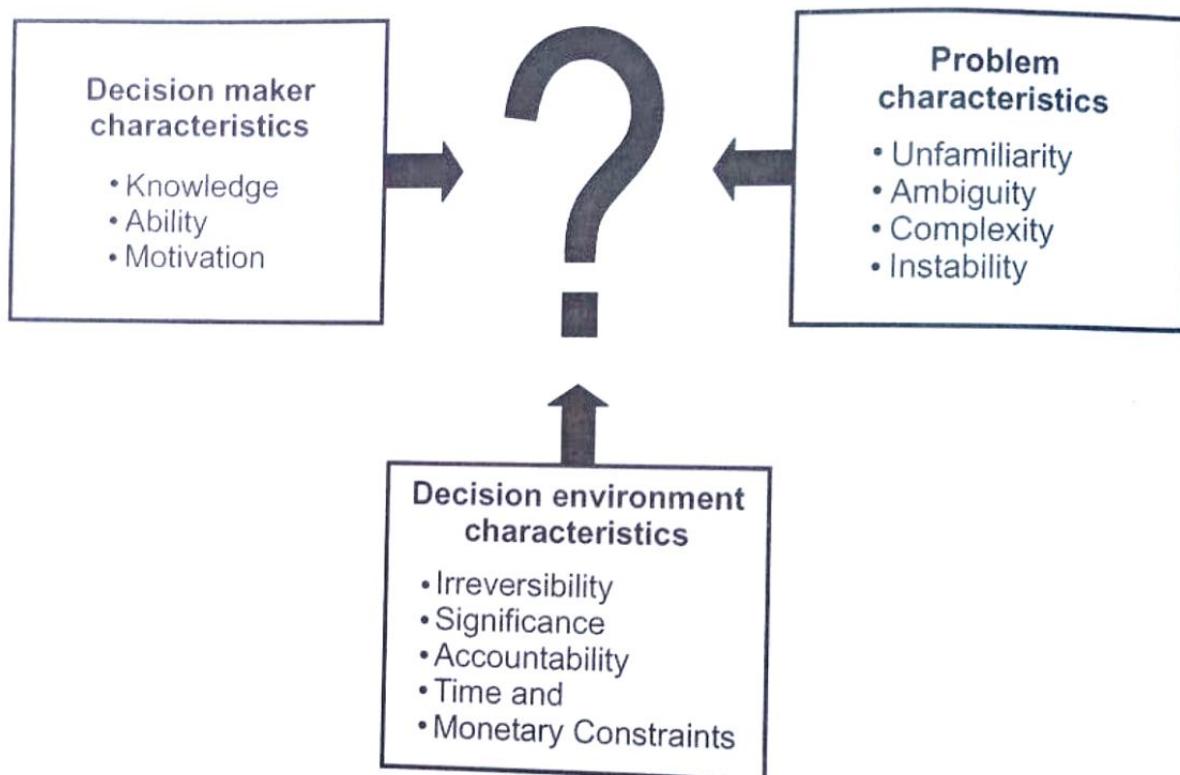


Fig. 1.11.4 Influences on the decision process

### 1.11.6 Impact of Groups on Decision Making

- Group decision making is the social interaction in the process, which complicates the dynamics. In some situations, group decision making can be an asset, but other times it can be a liability. The trick for you as a manager is to discover when and how to invite group participation in decision.

- ⇒ In establishing objectives, groups are typically superior to individuals in that they bring greater cumulative knowledge to problems.
- ⇒ In identifying alternative, individual efforts ensure that different and perhaps unique solutions are identified from various functional areas that later can be considered by the group.
- ⇒ In evaluating alternatives, group judgement is often superior to individual judgement, because it involves a wider range of viewpoints.
- ⇒ In Choosing alternatives, involving group members often leads to greater acceptance of the final outcome.
- ⇒ In Implementing the choice, individual responsibility is generally superior to group responsibility. Whether decisions are made individually or collectively, individuals perform better in carrying out the decision than groups do ?
- You cannot conclude that either individual or group decision making is superior. Rather, the situations and the individuals involved should guide the choice of decision technique.
- Because participation helps involve employees and increases satisfaction and interaction, it has been an important part of quality improvement efforts. For example, team based efforts to improve products and processes have always worked best when they included significant participation in decision making.

### 1.11.7 Methods for Deciding Decision Alternatives

- There exist certain methods to help manager to decide among the alternatives. The best alternative is selected on satisfying certain goals.
- Various methods for selecting decision alternatives are -  
1. Optimisation Techniques    2. Payoff Analysis    3. Decision Tree Analysis.

### 1.12 Short Answered Questions

Q.1 Define digital firm. Give characteristics of digital firm.

Ans. : Digital firm

- Digital firm is an organization where nearly all significant business processes and interaction and processing of information among customers, suppliers, employees, employer and the stakeholders are digitally enabled.
- Characteristics of a digital firm :
  1. Significant business relationships are digitally enabled and mediated.
  2. Core business processes are accomplished through digital networks and span the entire organization.

3. Key corporate assets are managed digitally.

4. Internal and external environments are quickly recognized and dealt with.

**Q.2** Define information system. What are fundamental role of information system ?

**Ans. : Information system -**

- Information system is defined as group of elements organized with the purpose of supporting management and operational decision making.
- **Fundamental role of information system**
  1. Support of business operation
  2. Support of managerial decision making
  3. Support of strategic competitive advantage

**Q.3** Explain subsystem of information system.

**Ans. : Subsystem of information system**

- Information system usually consists of subsystems. Subsystems send and receive data from each other. Subsystems may be open or closed.
- An MIS is a comprehensive and co-ordinated set of information subsystems to enhance productivity in conformance with manager's styles and characteristics.
- MIS is a powerful tool for budgeting, forecasting, modelling, project planning and control, diversification.

**Q.4** Define MIS. List components of information system.

**Ans. : Definition of MIS :** MIS is an integrated user machine system for providing information to support operations, management and decision making functions in an organization. The system utilizes computer, hardware, software, manual, procedures, models for analysis, planning and control, decision making and a database.

**Components of Information System (IS) :**

1. Hardware resources      2. Software resources
3. Data bases                4. Network resources
5. People resources

**Q.5** State effectiveness criteria of MIS.

**Ans. : Effectiveness criteria of MIS :**

1. Rationality in decision - making.
2. Effective MIS produces timely, accurate, clear, non-redundant and valid information.
3. Quality in decisions.
4. Controls are properly assured.

5. Management is motivated to use MIS.

6. Management should be involved in design of MIS.

Q.6 Explain MIS implementation challenges.

**Ans. : MIS implementation challenges**

- The more specific categorizations of the issues can be viewed as : Management process issues, organizational environment issues, leadership issues, technical systems issues, and personnel issues.

1. **Management process issues** i.e. functional operation of an organisation such as budgeting, personnel and general management.

2. **Organizational environment issues** are identified as factors which are less tangible such as organizational culture, change and behavior.

3. **Leadership issues** relate to the areas which involve the interaction and direction of the organisation executive.

4. **Technical systems issues** are mainly those referring to the hardware and software considerations of information technologies.

5. **Personnel issues** are those issues surrounding each individual in the organisation.

- These issues impact the planning, procurement and deployment of information systems in their organizations.

Q.7 State the factors to be considered for long term information system planning.

**Ans. : Factors to be considered for long term information system planning**

- A comprehensive long term information resource plan must address, the following elements : The information needs of the organization (strategic, tactical and operational), which are often expressed as an information architecture.

• The resources required to supply those needs, including :

1. **Human resources** - Managerial, professional and technical, operational, recruitment, skills and training, the human support infrastructure, career planning and management succession.

2. **Physical resources** - Information technology (e.g., hardware, software, communications and their evolving configurations) as well as tools for the storage, retrieval, movement. This category also includes other equipment and supplies and facilities.

3. **Financial resources** - Operating and capital expenditures.

4. **Information resources** - Which is handled by information technology as well as by libraries, mail rooms, file storage, conversations and people's memories. Organization plans for acquiring, developing, deploying, managing and disposing of the resources.

**Q.8** State important type of information systems and their area of application.

**Ans. :**

Sr. no.	Types of information system	Area
1.	Management Information System (MIS)	Information, for managers and end users
2.	Decision Support System (DSS)	Decision making, for managers
3.	Expert System (ES)	Knowledge, from experts
4.	Accounting Information System (AIS)	Information, for managers, users

**Q.9** What models of MIS are used for strategic planning in an organization ?

**Ans. :** MIS has various models to help the business organization in strategic planning

1. Forecasting model for investing future.
2. Business model for evaluating strategy performance.
3. Functional model for new product launching, budgeting.
4. PERT/CPM model for project planning.

**Q.10** State the role of MIS in top management functions.

**Ans. : Role of MIS in top management functions :**

1. In deciding the goals and objectives.
2. In determining status of business.
3. To provide the correct focus of action.
4. To determine mix of strategies.
5. In evaluating performance of strategies and to provide feedback.
6. In cost-benefit evaluation.
7. In mobilizing resources and mix of resources.

### 1.13 Multiple Choice Questions

**Q.1** An \_\_\_\_\_ is a set of processes and procedures that transform data into information and knowledge.

- a information system
- b knowledge system
- c database system
- d computer system

**Q.2** Information technology is the combination of computer science and \_\_\_\_\_.

- a telecommunications
- b electronics
- c digital marketing
- d networking

Q.3 An MIS provides \_\_\_\_\_.

- a past information
- b present information
- c future information
- d all of the above

Q.4 Decision support system used by top management level is \_\_\_\_\_.

- a Management Information System (MIS)
- b Executive Support System (ESS)
- c Group Decision Support System (GDSS)
- d All of the above

Q.5 Information systems that monitor the elementary activities and transactions of the organizations are \_\_\_\_\_.

- a management level system
- b operational level system
- c knowledge level system
- d strategic level system

Q.6 Management information systems usually \_\_\_\_\_.

- a Serve managers interested in weekly, monthly and yearly results, not day-to-day activities
- b Help managers make decisions that are unique, rapidly changing, and not easily specified in advance
- c Provide managers with a generalised computing and telecommunications capacity that can be applied to a changing array of problems
- d Perform and record the daily routine transactions necessary to the conduct of business

#### Answer Keys for Multiple Choice Questions :

Q.1

a

Q.2

a

Q.3

d

Q.4

b

Q.5

b

Q.6

a



# 2

## Unit II

### Organization, Management and Network Enterprise

#### Syllabus

*Information systems in today's global business: The Role of information system, Perspective's on Information System. Global E-business and collaboration : Business Processes, Types of Information Systems. System for Collaboration and Team Work : Tools and technologies for collaboration and team work, E-mail and Instant Messaging, Social Networking, Virtual worlds, Internet based Collaboration Environments. Information system organization and strategy, Ethical and social issues in information system.*

#### Contents

- 2.1 Information Systems in Today's Global Business
- 2.2 Types of Information Systems
- 2.3 System for Collaboration and Teamwork
- 2.4 Tools and Technologies for Collaboration and Teamwork
- 2.5 Short Answered Questions
- 2.6 Multiple Choice Questions

## 2.1 Information Systems in Today's Global Business

### The role of information system

- Any business can be successful only when there is a consistent management of organizational and financial data with efficient information systems.
- E-mail, online conferencing, smartphones and tablet computers have become essential tools for conducting business. Information systems are the foundation of fast-paced supply chains.
- An information system can help in analyzing independent processes and enable organized work activities.
- The internet allows many businesses to buy, sell, advertise and solicit customer feedback online.
- Business information system makes it simple to store operational data, revision histories, communication records and documents.

### Perspectives on information system

- Organizations are trying to become more competitive and efficient by digitally enabling their core business processes and evolving into digital firms.
- The internet has stimulated globalization by dramatically reducing the costs of producing, buying and selling goods on a global scale.
- New information system trends include the emerging mobile digital platform, online software as a service and cloud computing. Information systems are sociotechnical systems.
- Information systems are transforming business in following way -
  - Emerging mobile digital platform.
  - Growing business use of "big data."
  - Growth in cloud computing.
- An effective information system can entitle an organization with better planning, decision-making and hence desired results.
- Businesses continuously seek to improve the efficiency of their operations in order to achieve higher profitability.
- Information systems and technologies are some of the most important tools available to managers for achieving higher levels of efficiency and productivity in business operations, especially when coupled with changes in business practices and management behavior.

- Business has globalization opportunities -
  - Internet has drastically reduced costs of operating on global scale.
  - Increases in foreign trade, outsourcing.
  - Presents both challenges and opportunities.

## 2.2 Types of Information Systems

- Information system can be classified in various ways. Basis of classification of IS are -

1. By function	a) Operations b) Administrative/ Tactical c) Planning and control/ Strategic planning
2. By type of processing	a) Batch b) Online / Real time c) Distributed
3. By usage	a) Transaction processing b) Management information c) Decision support
4. By application	a) Manufacturing b) Distribution c) Marketing d) Serials e) Banking f) Transportation
5. By resources	a) Information resources b) Financial resources c) Personal resources d) Marketing resources

- In a business organization the information system is classified according to the role it plays i.e. operations support systems and management support systems. These can be further divided into few categories. Fig. 2.2.1 shows this classification of information system.

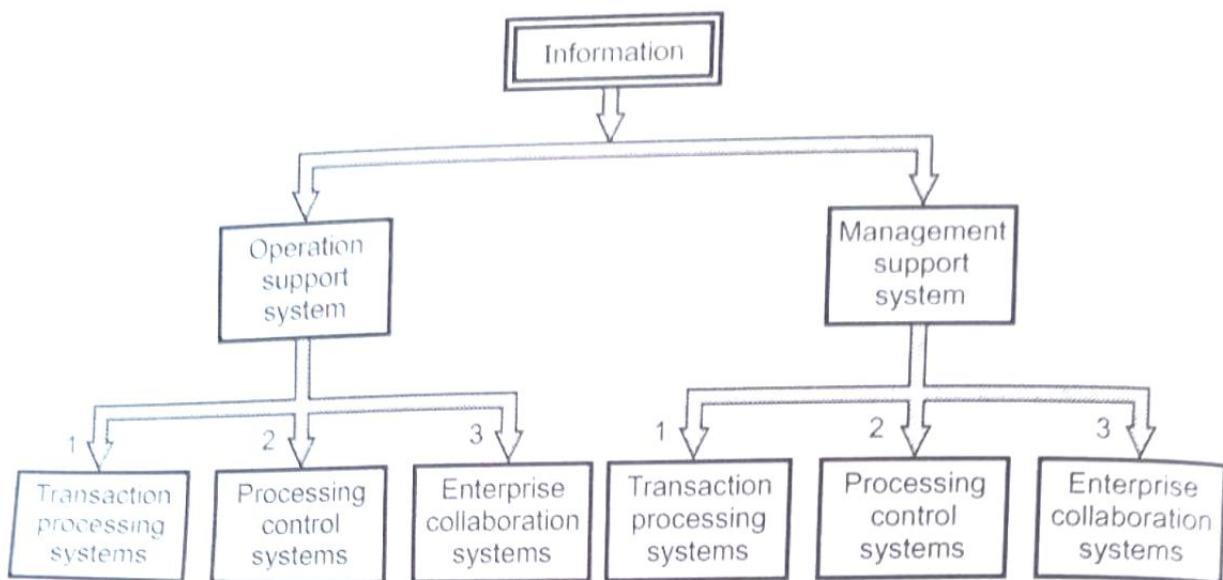


Fig. 2.2.1 Operations and management classification of information systems

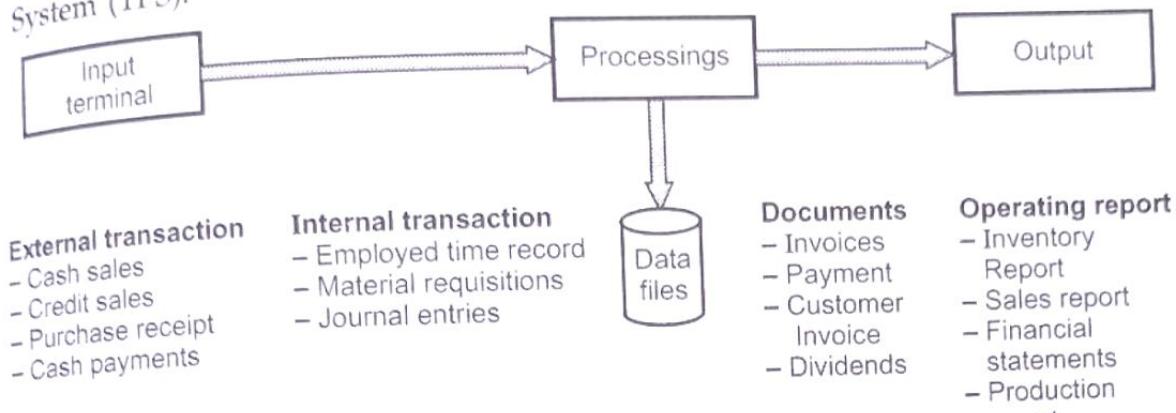
## 2.2.1 Operations Support Systems

- In business organization the data generated is processed by information system for the use of end user. Variety of information products (reports) are to be generated from Internal and external users. Such a system is called operations support system.
- Operations support system is employed for efficient processing of business transactions, control industrial process, support communications and to update corporate databases.
- Three major types of operations support systems are -
  1. Transaction Processing Systems (TPS).
  2. Process Control System (PCS).
  3. Enterprise Collaboration System (FCS).

### 2.2.1.1 Transaction Processing Systems (TPS)

- In a business organization operations like order entry, accounts payable and stock control system. They process the detailed data generated in the payable and stock control systems. Transaction processing system record and process data resulting from business transactions. The detailed data are normally referred to as transactions and include customer orders, invoices, inventory changes. This data is essential to support the day to day operations.
- The results of transactions are used to update customer, inventory and add value to its products and services. These databases then provide the data resources for Management Information System (MIS), Decision Support System (DSS) and for other processing.

- Transaction processing system plays a vital role in business process by producing variety of information products for internal and external use. Therefore, transaction processing systems are sometimes referred to as the life blood of the organization.
- Externally generated transactions are from customers, vendors and other groups. Internal transactions includes employee time records, material requisitions, journal entries etc. The output of Transaction Processing System (TPS) are documents and operations reports. Fig. 2.2.2 shows components of a Transaction Processing System (TPS).



**Fig. 2.2.2 Components of TPS/ TPS cycle**

- There are several types of transaction processing systems. TPS in a manufacturing system is shown in Table 2.2.1.

Sr. No.	TPS	Typical transactions
1.	Sales	Sales order, sales returns
2.	Cash	Cash receipts
3.	Accounts receivables	Credit sales, credit slips
4.	Cost accounting	Accounting for labour and material used in production
5.	Materials inventory	Materials receipts and delivery
6.	Plant and machinery	Depreciation, additions and dispositions
7.	Engineering	Engineering systems
8.	Personnel	New employees, promotions, transfers
9.	Purchase	Purchase orders
10.	Marketing research	Consumer survey results

**Table 2.2.1**

## Types of transaction processing

- There are three different type of transaction processing.
- a) Batch transaction processing.
- b) Single transaction processing.
- c) Online/Real time transaction Processing.

### a) Batch transaction processing :

- Most organizations handle a large number and variety of transactions simultaneously. For example, marketing activity alone may generate cash sales, credit sales, sales commissions and other variety of sales related transactions of different products. Also various activities related to selling are carried out, for example, advertising effectiveness analysis, product life cycle studies, market survey. An efficient way to process these transactions is to collect all transactions of the same type for a period of time and process them as one batch of transactions. For example, the sales transaction for a particular product may be processed once a day as one batch, with all entered at one time into computer for processing.
- Batch processing enables better control over processing and it makes possible efficient scheduling of computer processing. A transaction type example is payroll transaction that is almost always processed in batches.

### b) Single transaction processing :

- Single transaction processing is an alternative for batch processing. In this, each transaction is entered by itself into the computer system. There is usually no delay while waiting to accumulate a batch of transactions for processing and therefore the records are updated on a more timely basis.
- The single transaction processing is used where fast speed of processing provides significant advantages.

### c) Online / Real-time transaction processing :

- When the transaction is processed not only singly but also as it occurs, it is said to be processed in an On-Line, Real-Time (OLRT) mode. Here the record files are kept on line i.e. they are electronically connected to the computer and the transaction is processed quickly enough to affect the activity that generated the transactions.
- Typical example of OLRT data processing is airline reservations systems. A request for a flight reservation is entered and computer responds immediately with a reservation or with a message that the flight is fully booked.

### 2.2.2 Process Control System (PCS)

- Operations support system is also used to control operational processes by making suitable decisions. The information system that helps to control operational process is called process control system. It helps to control production process by taking decisions automatically by computers. Typical example of process control system is chemical process for measuring level. The chemical process is monitored by electronic sensors attached to computer system.
- The computer monitors the process capture the process data sensed by sensors and takes suitable decisions.

### 2.2.3 Enterprise Collaboration System (ECS)

- Enterprise Collaboration System is a type of information system that uses different information technologies to help people so that they can work together.
- Enterprise collaboration system helps to communicate data, share resources. In a business organization ECS uses information technology to improve productivity and creativity of teams. Different workgroups of internal and external members may be formed for improvement and new product development. They can make use of Internet, intranet and extranets also collaboration software known as groupware may be used. For more efficient way of communication data and video conferencing may be employed.

## 2.2 Management Support System

- Management support system helps managers in effective decision making by providing information in required format. In an organization, Management Information System (MIS) is used for efficient and effective data processing. There are two important reasons of using MIS.
  - Management Orientation** - In business, the MIS emphasis the management orientation of information technology. A computer based information system must not only process the data generated by business transaction but it should support in decision making.
  - System Framework** - A system framework must be used for organizing information system applications. Applications of information technology is interrelated and integrated Computer Based Information System (CBIS). Fig. 2.2.3 shows this interrelated and integrated computer based information subsystem.
- CBIS provides information and support to all levels of management in required form. Different information system focuses on different areas/aspects of business organization. Table 2.2.2 shows important types of information systems and the area it is related to.

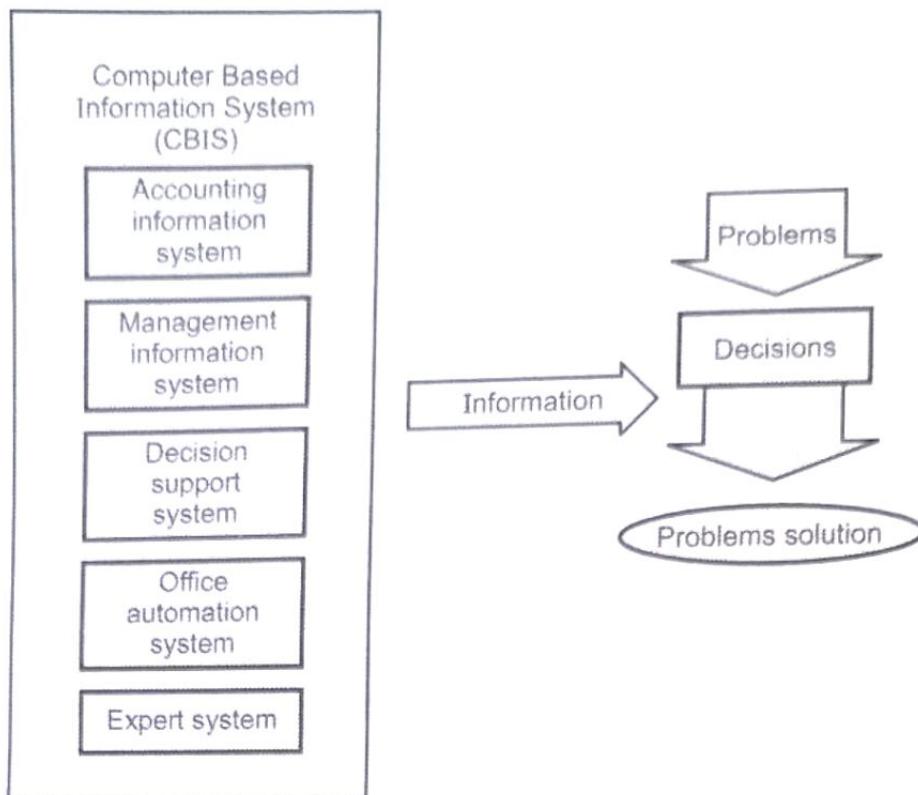


Fig. 2.2.3 CBIS subsystems

Sr. No.	Types of information system	Area
1.	Management Information System (MIS).	Information, for managers and end users.
2.	Decision Support System (DSS).	Decision making, for managers.
3.	Expert System (ES).	Knowledge, from experts.
4.	Accounting Information System (AIS).	Information, for managers, users.

Table 2.2.2

### 2.2.21 Management Information System (MIS)

- MIS is the most common type of management support system. MIS provides information to the managers to help in routine decision making process. It provides reports in different formats as desired by the managers. It uses internal databases and transaction processing system to update the information. Sometimes data from external sources are also used.
- Various information products are available in different forms, it can be generated on any of the following conditions.

- On demand
- Periodically
- Whenever exceptional conditions occur
- A sales manager can obtain information
  - Instantly about sales at his workstation.
  - By accessing weekly sales report.
  - Whenever sales target is not achieved or any sales person fails to produce sales report.

### **22.2.2 Decision Support System (DSS)**

- DSS is an improved form of information reporting system and Transaction Processing System (TPS). Managers are able to tailor the computer output to participate quality - related problems.
  - DSS is an interactive Computer Based Information System (CBIS) which uses specialized databases for decision making models. But DSS is different than TPS since it does not focus on data generated by transactions/operations. DSS is also different than MIS because it does not provide information in prescribed form that is used for routine decisions.
  - DSS provides information in interactive session on adhoc or temporary basis.
- Decision support system has following features -

1. Analytical modelling
  2. Simulation
  3. Data retrieval
  4. Information presentation capability.
- Any unstructured form of information can be generated by interactive simulation based process. Information of alternative sets can be generated by simulating and exploring possible alternatives.

### **22.2.3 Executive Information System (EIS)**

- Executive information system is a type of management information system. EIS are designed to meet the strategic information needs of top level management. Executive receives the necessary information from letters, memos, reports, periodicals and by computer system. Other information sources are meetings, telephone calls and social activities. It can be observed that top executives receive major information from non-computer sources.
- The objective of computer based executive information systems is to provide top management an easy access to selective information about firm's strategy. EIS are easy to understand and operate. DSS and EIS generally are proposed for providing data in support of unstructured decision making. A decision is unstructured if the decision making process can not be described in details. This may be because the

problem has not arisen before. It is characterized by incomplete or uncertain knowledge or uses non-quantifiable data. Examples of unstructured decision-making are selecting personnel and determining investment.

- EIS provides information about current status and projected trends for certain important factors. For this, access for internal and external database is provided. Also EIS provides information to executives in easily usable formats or graphical patterns.

### 2.2.3 Classification Based on Activities

- Depending on activities of an organization information system can be classified into three types.
  - Strategic planning information system.
  - Tactical information system.
  - Operational information system.

Fig. 2.2.4 shows the framework for information systems.

Activities	Requirements	Outputs
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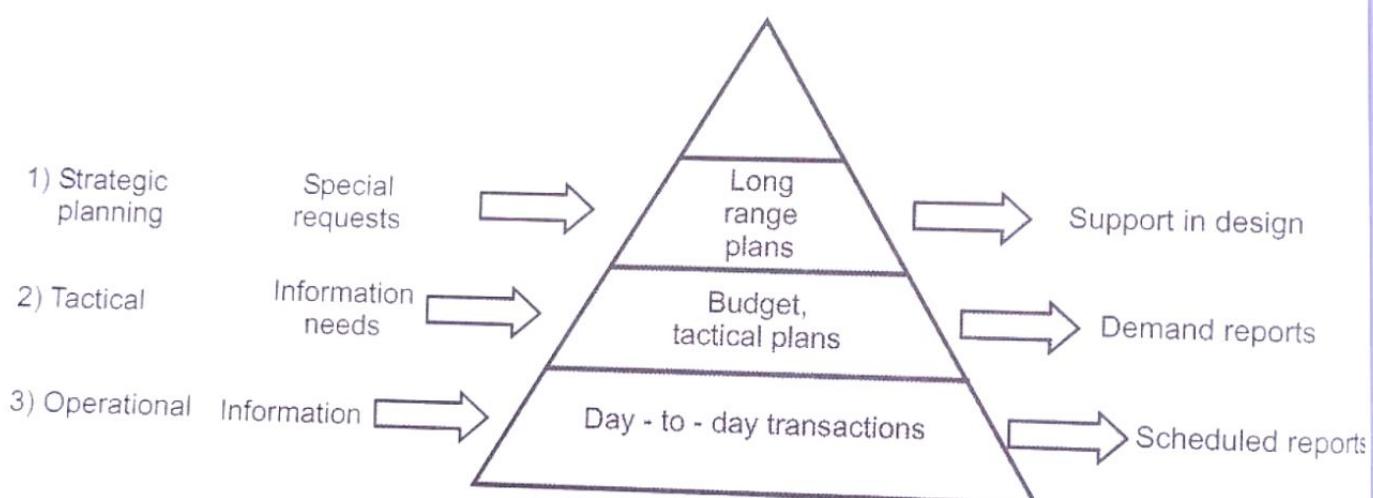


Fig. 2.2.4 Frame work for information systems

#### 1. Strategic Planning Systems :

- Strategic planning systems are designed for top level management. Top level management uses this information systems for long term organizational planning.

#### 2. Tactical Systems :

- Tactical systems are designed for middle level management. Middle level management uses tactical system for monitoring and control operations and to allocate resources effectively.

**3. Operational Systems :**

- Operational system is designed for level management. Management uses the system for day to day operations e.g. accounts, sales, inventories, transportation.

**2.2.4 Other Classification of Information Systems**

- Many different information systems are being used for either operations or management applications. These include expert systems, knowledge management systems, strategic management systems and business information systems.

**2.2.4.1 Expert Systems**

- Unlike DSS, expert systems have the potential to extend a manager's problem solving ability beyond his or her normal capabilities. An **expert system** consists of four main components :
  - A user interface
  - A knowledge base
  - An inference engine
  - A development engine
- The knowledge base uses rules to express the logic of the problem that the expert system is designed to help solve. The inference engine uses reasoning similar to human in processing the contents of knowledge base. The development engine consists of either programming languages or prewritten inference engines called expert system shells. Prototyping is especially applicable to the development of an expert system. Artificial intelligence is applied in expert system.
- **Artificial Intelligence (AI)** - is the activity of providing computers within the ability to display behaviour that is regarded as intelligence observed in humans. Such as reasoning, learning and problem solving. An expert system is also known as **knowledge based system** i.e. a computer program that attempts to represent the knowledge of human experts in the form of heuristics. Heuristic is rule of good guessing. Expert system is being applied in various fields such as engineering, sciences, medicines and in business.

**2.2.4.2 Knowledge Management System (KMS)**

- **Knowledge Management System (KMS)** are a group of information technologies used for managing knowledge within organizations. Knowledge is information in a network of relations with rules for the use of information.
- In today's competitive business environment companies are trying to become knowledge creating companies i.e. creating new business knowledge and creating new business services or products. This is essential in order to survive and to sustain in rapidly changing environment. KMS involves integrating tacit (stored in

mind) with explicit (stored in database) knowledge. Tacit knowledge is clearly understood knowledge in individual, knowledge from books, knowledge from experience while explicit knowledge is process and procedures.

- Knowledge management - systems helps knowledge workers create organize and share business know how focus of KMS is on sharing/ reuse of knowledge by
  - Learn once, use again and again
  - Make all organizational learning usable by all.
- Most KMS rely on following information sources :
  - i. Internet websites
  - ii. Intranets
  - iii. Knowledge bases
  - iv. Discussion forums.

### **2.2.4.3 Strategic Information System (SIS)**

- A **Strategic Information System (SIS)** may be defined as any information system which directly assists on organization in achieving its organization strategy.
- SISs are information systems that impact on competitive position of the organization. They are systems that directly support organizational strategy and are critical elements of an organizations informatics strategy. SIS can be used to improve competitive advantage in terms of cost, differentiation and location SIS generally have a short life - span because competitors soon replicate the system. Any type of IS can be strategic information system i.e. MIS, TPS, OSS.

#### **Essentials of SIS**

- Essential of strategic information system are mentioned here -
  1. SIS must be a part of strategic plan of the organization.
  2. SIS must have support from top management.
  3. SIS must not be owned by any one departmental but must belong to all departments.

#### **Sources of SIS**

1. **Existing System** : Potential use of existing system for strategic advantage can be recognized.
2. **Excess Information** : Excess information collected previously may turn out to be a source of strategic information.
3. **New Technology** : New developed technology can be adopted to get competitive advantage.

### **2.2.4.4 Business Information System (BIS)**

- The information systems required for smooth operations and management activities (accounting, finance, human resource management, marketing) are **business information systems**.
- The business information system provides variety of information products to the managers for decision - making for example, marketing manager requires information about sales volume, target and individual performance, area wise sales etc.

### **2.2.4.5 Integrated Information Systems**

- In real world application an integrated form of information systems are used. Generally classification of information system is done as per their functional roles. These functional roles are interrelated hence it is necessary to use cross functional information systems. For example, sales order processing that is a operation support system and sales analysis which is marketing information system. These two information system are integrated information system. Sales order processing data is input for sales analysis system.
- Information system classification summarized along with their description in Table 2.2.3.

Sr. No.	Type	Description
<b>[A] Operations support systems</b>		
1.	Transaction processing system	- TPS process data from business transaction.
2.	Process control system	- Monitor and control business process.
3.	Enterprise collaboration system	- Support groups, teams, communications.
<b>[B] Management support systems</b>		
4.	Management information system	- Provide information in prescribed format.
5.	Decision support system	- Provide interactive ad-hoc support for decision making.
6.	Executive information system	- Provide critical information in required format.

### [C] Other categories

7.	Expert systems	- Knowledge based system provide expert advice.
8.	Knowledge management system	- Knowledge based system provide creative form.
9.	Strategic information system	- Provide strategic products/ service for competitive advantages.
10.	Business information system	- Provide support of operational and managerial application of business.

Table 2.2.3 Information system classification

## 2.3 System for Collaboration and Teamwork

- Collaborative technology refers to dedicated tools and systems designed to enable and facilitate group work, both in-office and remote.
- Teamwork and collaboration form the fundamentals of any successful business. When employees share a common goal, combine their strengths and help each other out when needed, an organization is bound to strive.
- The collaboration technologies used today function by providing space and resources to help improve team productivity.
- Collaboration is a strategy that can be used in any type of workplace, including non-profits, corporations, government agencies, service providers and educational institutions.
- All employers and employees in the organization can benefit from learning about different types of collaboration.
- There are three fundamental elements to successful group work regardless of setting :
  1. Proximity
  2. Permissiveness
  3. Familiarity
- Collaboration in the workplace occurs when people work together to achieve a goal. It's another way of looking at teamwork.
- The team can use many different ways to work together depending on the project they are working on. Sharing ideas and discussing the approach the group is going to take is an excellent way to make the process work much more smoothly for everyone.

### Benefits of collaboration technology

- Some important benefits of collaboration technology are :
  1. Increased creativity and innovation in organizations.
  2. Potential for cost savings.
  3. Increased effectiveness of group work.
  4. Significantly expanded number of potential partners and expertise available to a company.
  5. Improved information accessibility and transparency.
  6. Improved work and leadership environment.
  7. Facilitated fluid workforces and speedy decision-making.

## 2.4 Tools and Technologies for Collaboration and Teamwork

- Most online collaboration tools are cloud-based tools that help distributed teams organize, manage and execute collaborative work.
- These tools allow you to communicate, manage projects and tasks and share/store files no matter where you and your team members are located.
- The best online collaboration tool is the one that helps your team do their best work.
- Every team will have a slightly different features wish list and different needs, but the desired result, efficient team collaboration, looks the same in every team.

### Features of collaboration tools -

- Many features of collaboration tools are geared toward the facilitation and management of effective communication among team members.
  1. Clear, effective communication.
  2. Motivated and empowered team members.
  3. Clear roles and expectations.
  4. Idea brainstorming.
  5. An organizational structure and management style that fosters great work.
  6. Achieving defined goals together.

### 2.4.1 Communication Technology

- Communication software tools allow for messages, chat groups and conversations to be conducted between individuals and parties via the Internet, whether those parties are in different parts of the office or different parts of the world.

- Communication tools also tend to be unstructured. They do not require scheduling or calendar sharing to be effective - in fact, they're not intended to be formally preemptive at all.
- Examples of communication technology include :
  - Email
  - Instant messaging apps
  - Team, department or org-wide chat forums
  - Digital voicemail applications
  - Voice-over-Internet Protocol (VoIP) calls.

### 2.4.2 E-mail and Instant Messaging (IM)

- E-mail and instant messaging (including text messaging) have been major communication and collaboration tools for interaction jobs.

#### 1. Wikis

- Wikis are very useful tools for storing and sharing corporate knowledge and insights.
- Wikis are typical web site that makes it easy for users to contribute and edit text content and graphics without any knowledge of web page development or programming techniques.

#### 2. Virtual Worlds

- Virtual worlds are online 3-D environments populated by "residents" who have built graphical representations of themselves known as avatars.

### 2.4.3 Internet based Collaboration Environments

- There are tools for conferencing and videoconferencing providing multi-function platforms for collaboration and social business among teams of employees who work together from many different locations.

#### 1. Virtual Meeting Systems

- In an effort to reduce travel expenses, many companies, both large and small, are adopting videoconferencing and web conferencing technologies.

#### 2. Cyberlockers

- Cyberlockers are online file-sharing services that allow users to upload files to secure online storage sites from which the files can be shared with others.

**3. Microsoft SharePoint**

- Microsoft SharePoint is a browser-based collaboration and document management platform, combined with a powerful search engine that is installed on corporate servers.

**4. Lotus Notes**

- Lotus Notes is a groupware, a collaborative software system with capabilities for sharing calendars, collective writing and editing, shared database access and electronic meetings, with each participant able to see and display information from others and other activities.

**2.5 Short Answered Questions**

**Q.1** What is a computer based information system ?

**Ans. : Computer based information system :**

- Applications of information technology are interrelated and integrated Computer Based Information System (CBIS).
- CBIS provides information and support to all levels of management in required form.
- Different information system focuses on different areas/ aspects of business organization.

**Q.2** What are the indicators of system ineffectiveness ?

**Ans. : Indicators for system ineffectiveness are -**

1. Excessive down time and idle time.
2. Slow system response time.
3. Excessive maintenance costs.
4. Inability to interface with new hardware/software.
5. Unreliable system outputs.
6. Slow system response time.
7. Data loss.
8. Excessive run costs.
9. Frequent need for program maintenance and modification.
10. User dissatisfied with output format, content or timeliness.

**Q.3** Define efficiency of an information system.

**Ans. : Efficiency of information system -**

- The efficiency indicates the manner in which the inputs are used by the system. Being efficient means the system uses inputs in a 'right' way.

- If the input-output ratio is adverse, it is said that the system is inefficient though it produces the desired output.

**Q.4** Briefly describe the major types of information system in organization.

**Ans. : Types of IS -**

- Transaction Processing Systems (TPS)** : Are the basic business systems that serve the operational level of the organization. And it is also a computerized system that performs and records the daily routine transactions necessary to conduct business.
- Management Information Systems (MIS)** : Serve the management level of the organization, providing managers with reports and often-online access to the organization's current performance and historical records and primarily serve the functions of planning, controlling and decision-making.
- Decision-Support System (DSS)** : Also serve the management level or the organization. DSS help managers make decisions that are unique, rapidly changing and not easily specified in advance.
- Executive Support System (ESS)** : Serve the strategic level of the organization. They address nonroutine decisions requiring judgment, evaluation and insight because there is no agreed on procedure for arriving at a solution.

**Q.5** State the scope of the strategic planning system.

**Ans. : Strategic planning system -**

- Strategic planning systems deals with the projections of the future. A strategic planning system has two major functions : To develop an integrated, coordinated and consistent long-term plan of action and to facilitate adaptation of the corporation to environmental change.
- When introducing and developing such a system, companies commonly concentrate on its integrative aspects.

## 2.6 Multiple Choice Questions

**Q.1** EDP refers to \_\_\_\_.

- |                              |                              |
|------------------------------|------------------------------|
| a Electronic Data Process    | b Electronic Data Processing |
| c Electronic Data Projection | d Electronic Data Predict    |

**Q.2** To become an effective MIS department must state its \_\_\_\_.

- |          |             |
|----------|-------------|
| a goals  | b objective |
| c profit | d mission   |

Q.3 The management information system receives input from the _____.			
a EIS	b ES	c DSS	d TPS
Q.4 A combination of a MIS and DSS called _____ which helps top managers make decisions.			
a GIS	b EIS	c EPI	d CAM
Q.5 The first phase of IT planning is called _____ planning.			
a tactical	b project	c organisational	d strategic
Q.6 _____ is a prominent attribute of management information procured through MIS of an organization.			
a Explicitness	b Completeness	c Accuracy	d Exception based

## Answer Keys for Multiple Choice Questions :

Q.1	b	Q.2	d	Q.3	d	Q.4	b
Q.5	d	Q.6	a				

