

**UNIT I**

**Introduction to MIS:**

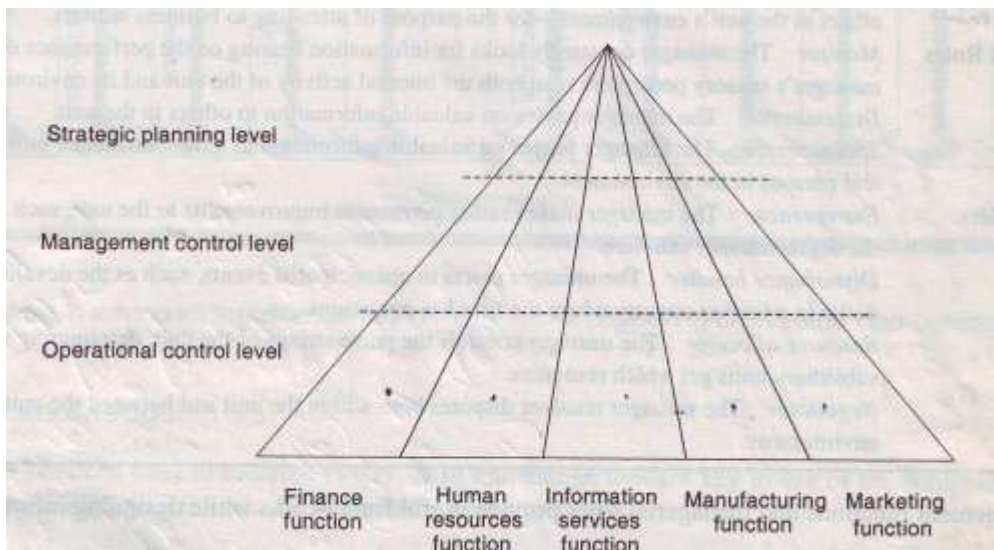
1. Introduction to MIS,
2. Definition of MIS,
3. Report writing s/w,
4. Mathematical modeling,
5. Concept of organizational information sub-system,
6. MIS and Human factor considerations,
7. MIS and problem solving
8. System approach to MIS.

**1. INTRODUCTION TO MIS**

**Define Management:**

It is an art of recurring maximum results with minimum effort so as to secure maximum prosperity and happiness for both employee and employer and give the public best possible services.

**Managers in Business Areas:**



**Fig.1.1 Managerial levels in an organization**

**Operational control level** –Lower level managers are responsible for the day-to-day operation, activities and transactions of an organization.

**Management control level** – Middle managers, who co-ordinate, control and monitor various activities in an organization and act as liaison between operational managers and top managers.

**Strategic planning level**– Top managers, establishes the vision and the long term goals of the organization.

**Table 1.1 Typical Management Information Systems**

	Production	Finance	Personnel	Marketing
Strategic	New plant location	Alternative financing	Welfare policy	Competitor survey
Tactical	Production bottleneck	Variance analysis	Performance appraisal	Advertising
Operational	Daily scheduling	Payroll	Leave records	Sales analysis

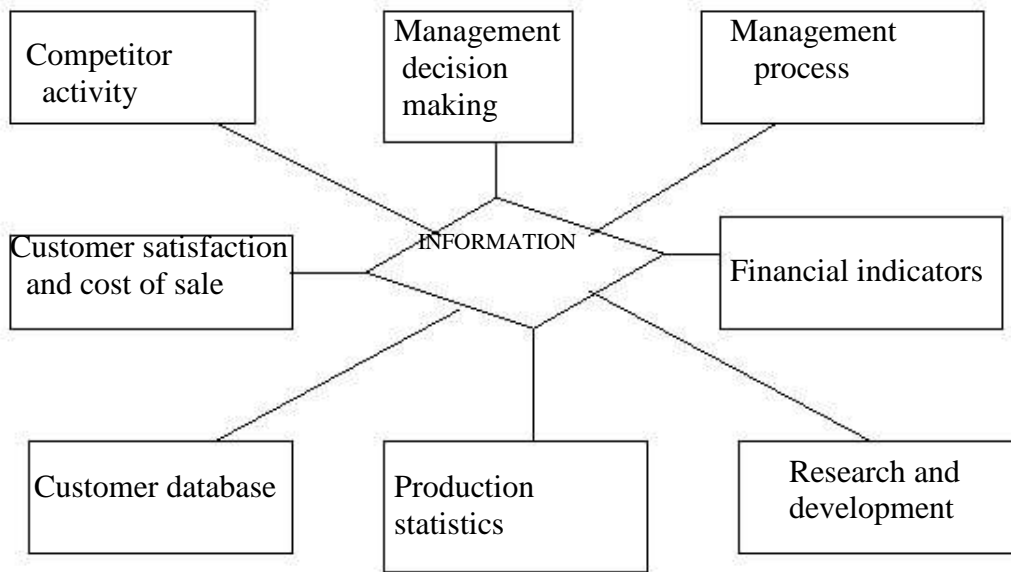
**Define system:**

A system is defined as an aggregation or assemblage of objects joined in some regular interaction or interdependence.

Ex: consider a factory system that makes and assembles parts into a product.

**Define Information:**

Data is a collection of raw facts, when we organize those data so that we able to get certain information and by the help of that information we are able to take certain decision.



**Fig.1.2 Life blood of any organization**

Almost all business organizations normally have some kind of information system for management. Accounting rules, stock control and market monitoring systems are the most traditional and common examples. The power of technology has transformed the role of information in business firm. Now information has become recognized as the lifeblood of an organization.

**Define information system**

A system, whether automated or manual, that comprises people, machines, and/or methods organized to collect, process, transmit, and disseminate data that represent information. The information system is the mechanism to ensure that information is available to the managers in the form they want it and when they need it. It is designed to support their work through providing relevant information for their decision-making.

## MIS Unit I

Computer systems can clearly aid organizations in the processing of data into accurate, well presented, up-to-date and cost-effective information. Whether that information is also concise, relevant, timely and complete will depend largely on the capabilities of the people involved in its processing and selection.

Its purpose is to help managers to solve structured problems. But it should also fulfill a number of other purposes:

- It should provide a basis to analyze warning signals that can originate both externally and internally; this is the main function of data base.
- It should automate routine operations thus avoiding human work in the processing tasks.
- It should assist management in making routine decisions.
- It should provide the information necessary to make non-routine decisions.
- It should serve as a strategic weapon to gain competitive advantages.

**Table 1.2 Types of information system**

Information System	Description
Executive Support Systems	<p>An <b>Executive Support System ("ESS")</b> is designed to help senior management make strategic decisions. It gathers, analyses and summarizes the key internal and external information used in the business.</p> <p>A good way to think about an ESS is to imagine the senior management team in an aircraft cockpit - with the instrument panel showing them the status of all the key business activities. ESS typically involve lots of data analysis and modeling tools such as "what-if" analysis to help strategic decision-making.</p>
Management Information Systems	<p>A <b>management information system ("MIS")</b> is mainly concerned with internal sources of information. MIS usually take data from the transaction processing systems (see below) and summarize it into a series of management reports.</p> <p>MIS reports tend to be used by middle management and operational supervisors.</p>
Decision-Support Systems	<p>Decision-support systems ("DSS") are specifically designed to help management make decisions in situations where there is uncertainty about the possible outcomes of those decisions. DSS comprise tools and techniques to help gather relevant information and analyze the options and alternatives. DSS often involves use of complex spreadsheet and databases to create "what-if" models.</p>
Knowledge Management Systems	<p>Knowledge Management Systems ("KMS") exist to help businesses create and share information. These are typically used in a business where employees create new knowledge and expertise - which can then be shared by other people in the organization to create further commercial opportunities. Good examples include firms of lawyers, accountants and management consultants.</p> <p>KMS are built around systems which allow efficient categorization and distribution of knowledge. For example, the knowledge itself might be contained in word processing documents, spreadsheets, PowerPoint presentations. Internet pages or whatever. To share the knowledge, a KMS would use group collaboration systems such as an intranet.</p>

## MIS Unit I

### Transaction Processing Systems

As the name implies, Transaction Processing Systems ("TPS") are designed to process routine transactions efficiently and accurately. A business will have several (sometimes many) TPS; for example:

- Billing systems to send invoices to customers
- Systems to calculate the weekly and monthly payroll and tax payments
- Production and purchasing systems to calculate raw material requirements
- Stock control systems to process all movements into, within and out of the business

### Office Automation Systems

Office Automation Systems are systems that try to improve the productivity of employees who need to process data and information. Perhaps the best example is the wide range of software systems that exist to improve the productivity of employees working in an office (e.g. Microsoft Office XP) or systems that allow employees to work from home or whilst on the move.

## 2. DEFINITION OF MIS

A system to convert data from internal and external sources into information and communicate that information in an appropriate form, to managers at all levels in all 3 functions to enable them to make timely and effective decisions for planning, directing and controlling the activities for which they are responsible. Management Information Systems (MIS) is the application of information technology to support business activities.

MIS refers broadly to a computer-based system that provides managers with the tools for organizing, evaluating and efficiently running their departments. In order to provide past, present and prediction information, an MIS can include software that helps in decision making, data resources such as databases, the hardware resources of a system, decision support systems, people management and project management applications, and any computerized processes that enable the department to run efficiently.

Within companies and large organizations, the department responsible for computer systems is sometimes called the MIS department. Other names for MIS include IS (Information Services) and IT (Information Technology).

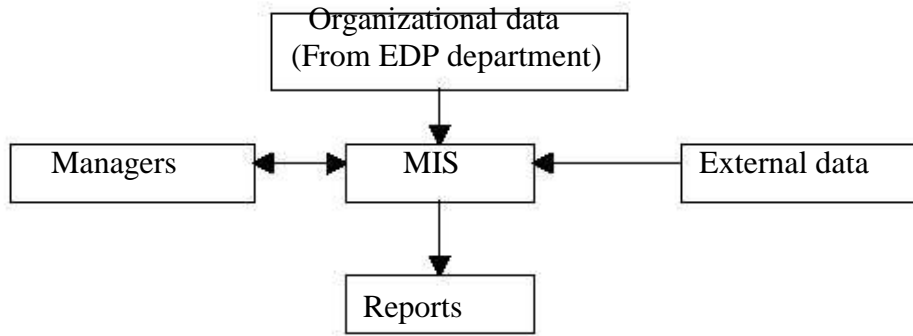
Efficient MIS enables management to plan co-ordinate, organize and control. It provides information needed for strategic planning and for day to day operations. The various levels of management typically require the information they receive to be formatted in different ways. These different levels of management decision-making can be described as follows: strategic, tactical and operational. So the information could be:

### Stages in the development of Management Information Systems

Organizations have always had some kind of management information systems, even if it was not recognized as such. Developments in the use of the new technology have gone through several stages.

*Stage 1: EDP.* When computers were first introduced into organizations, they were used mainly to process data for a few business functions – usually accounting and billing. Computers were located in electronic data processing (EDP) departments, because of the

specialized skills needed to operate the extensive and complex system.



**Fig.1.3 Stages of MIS**

*Stage 2: MIS.* The growth of EDP departments spurred managers to focus more on planning their organizations' information systems. As the EDP departments' function expanded beyond routine processing of masses of standardized data, they began to be called management information system (MIS) departments. MIS uses data created mainly in the EDP departments and it can be developed only when there already exists such department. It does not make any changes in these data. MIS could obtain information from internal and external sources.

*Stage 3: DSS.* Later on, when remote terminals were introduced, more than one department began to use the same system. At this stage the MIS has grown beyond a data Processing role and included the provision of a number of decision support systems (DSSs). While the MIS controls routine operations using data processing methods, the DSS is seen as supporting decisions on "less routine issues" and solving "semistructured" problems.

*Stage 4: ARTIFICIAL INTELLIGENCE and EXPERT SYSTEMS.* One of the fastest growing areas of information technology, artificial intelligence uses the computer to simulate some of the characteristics of human thought. The term artificial intelligence (AI) means the simulation of human thought process in order to select the best mode of behavior, e. g. taking a decision or responding to a situation. Expert systems are a major application of AI. They act like a human "expert" in analyzing unstructured situations. Expert systems are also called "knowledge-based" systems since they are built on a framework of known facts and responses to situations. It is believed that we are moving rapidly from industrial-based society to an information based one. The application of computer technology to management information and decision support systems has certainly had an effect on how managers perform their tasks and on how organizations behave.

An MIS provides the following advantages.

1. It Facilitates planning: MIS improves the quality of plants by providing relevant information for sound decision – making. Due to increase in the size and complexity of organizations, managers have lost personal contact with the scene of operations.
2. In Minimizes information overload: MIS change the larger amount of data in to summarize form and there by avoids the confusion which may arise when managers are flooded with detailed facts.

## MIS Unit I

3. MIS Encourages Decentralization: Decentralization of authority is possible when there is a system for monitoring operations at lower levels. MIS is successfully used for measuring performance and making necessary change in the organizational plans and procedures.

4. It brings Co ordination: MIS facilitates integration of specialized activities by keeping each department aware of the problem and requirements of other departments. It connects all decision centers in the organization.

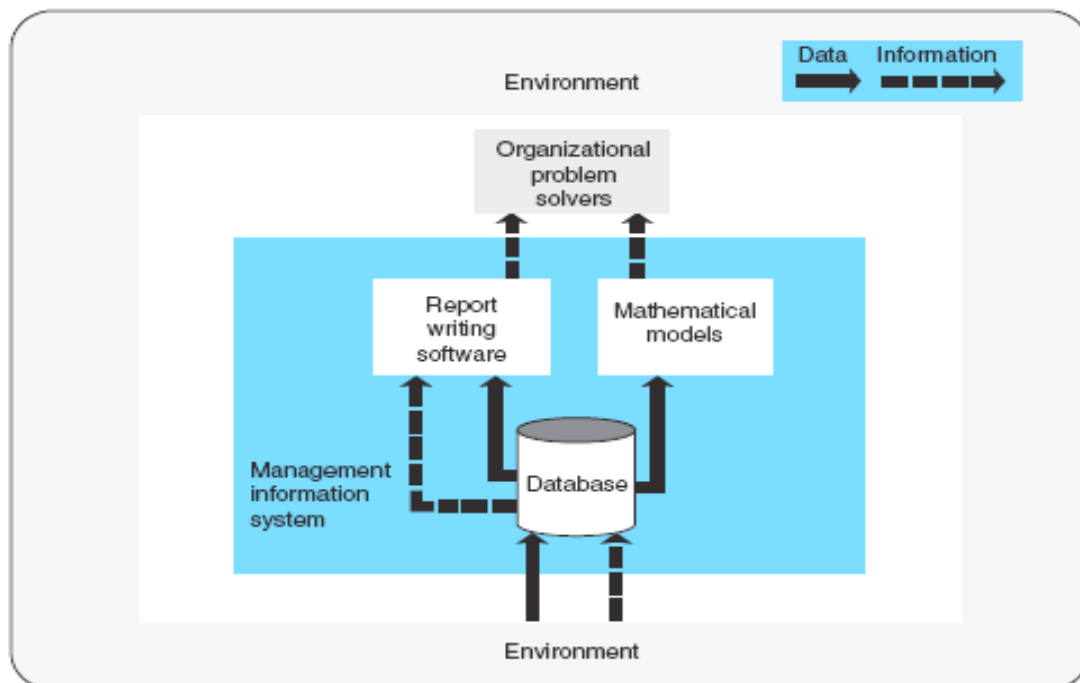
5. It makes control easier: MIS serves as a link between managerial planning and control. It improves the ability of management to evaluate and improve performance. The use of computers has increased the data processing and storage capabilities and reduced the cost

6. MIS assembles, process, stores, Retrieves, evaluates and disseminates the information.

### Early MIS Efforts

By the mid 1960, most large firms had finally overcome the pains of implementing their first computer system. It had been a difficult task, for those organizations had accumulated huge volumes of data and much effort was required to put the data in a form that was acceptable to the computers. Punched card and key driven machines were used only for data processing. Only a few computer literate people in the firms and those specialists had no real experience in guiding the implementation through the steps of the system life cycle. Managers became aware of computer's processes and power.

### An MIS Model



**Fig.1.4 An MIS model**

## MIS Unit I

- **Management Information System (MIS)** is a computer-based system that makes information available to users with similar needs.
- **Data base** - The data base contains the data provided by the accounting information system. The data base contents are used by software that produces reports as well as mathematical models.
- **Report-writing software** – produces both periodic and special reports.
- **Mathematical models** – produces information as a simulation of the firm's operations
- **Organizational problem solver** -The software outputs are used by persons who are responsible for solving the firm's problem.

### 3. REPORT WRITING SOFTWARE

#### Steps for report writing

- Define the problem
- Gather the necessary information
- Analyze the information
- Organize the information
- Write report

#### Report Format

- Title page
- Abstract/Executive Summary
- Table of contents
- Introduction
- Discussion
- Conclusions
- Recommendations
- References

#### Principles of reporting

- **Reports should highlight the important information:** Managers should not have waste time searching through a voluminous report to find the few pieces of information they need.
- **Reports should be as simple as possible:** Reports should be simple in format. For example, amounts in a balance sheet report usually should be reported to the nearest round figure.
- **Backup detail should be available:** Generally backup detail should be readily available but not provided, or it may be provided as separate supplementary report.

## Report presentation modes

- **Narrative form:** narrative description is often used where the information is subjective and qualitative, at least to an extent. Eg. Term paper, thesis and the president's address.
- **Tabular form:** tabular reports are also frequently used, which tabulates the production figures of one department.
- **Graphic form:** when the information is not quantitative or if only a general impression or an overview is needed, pictures can be used effectively. Graphs are one form of pictures that managers do use. Graphs are numeric data converted to picture. They usually portray relationships or compressions between quantitative information elements.

## Types of reports

**Periodic reports:** Provides routine reports on a scheduled time-period basis. These reports are issued weekly, quarterly or annually. Computerization has extended and enhanced the periodic reporting capability considerably. Frequency of periodic reports often increases because of computerization. The decreased cost of computer processing often increases the scope of periodic reports. The computer also makes it easier for periodic reports to include information generated by several different information systems.

**Key-indication reports:** it is the important variation on periodic reports. These reports typically provide a few of the critical statistics from the preceding days operation activities to managers on a daily basis. For example by 8 AM the sales manager of each district in a large, geographically decentralized company might receive a report on the total district sales for the preceding day and the national sales manager may have a report on all sales nations wide before noon that day. Also the production department supervisors might receive a report of total production and product scrap count for their departments for the preceding day at the time they start their morning work.

Key indicator systems are used when a manager wish to monitor certain critical aspects of operations at frequent intervals in order to react rapidly to trends or problems in these areas. The major benefit of a key indicator system is its timeliness which enables managers to keep their finger on the pulse of the most important activities within their jurisdiction on a daily basis.

**On-call reports:** they are periodic reports that a manager decides, are needed before the end of the period, perhaps because of an unexpected operations problem or a threat from, or an opportunities in the environment. Example, a manager wants to see a report of a production costs for the month to date, even though only a monthly report is scheduled. Computer systems can be organized to make this type of report, known as an "on – call report" available on a short notice. This capability usually involves keeping the files that provide the reports updated at frequent intervals so that whenever a report is requested, the file that provides it is already up to date.

**Special reports:** sometimes refer to as ad-hoc reports, are another type of unscheduled report that may be requested by managers. These reports are requested because the



## MIS Unit I

organization has encountered unexpected problems or has unanticipated informational needs. In most organizations management involves a stream of problems; some of these are unusual and unanticipated and will arise only once. Examples are inventory build-ups or shortages, sudden slumps in the sales of production in a particular product line or in the sales of a particular major product. Acquiring the information needed to analyze these unexpected problems is often difficult.

**Exception reports:** Reporting in many organizations incorporates the exception reporting principle: only those information items which will be of particular interest to a manager are reported.

Incorporating Management by Exception into reports in four basic ways:

- **Prepare the report only when exceptions occur:** this is the technique incorporated in the general systems model, and the overtime earnings report. The report is printed only when employees work overtime, each entry on the report is an exception.
- **Use the report sequence to highlight exceptions:** it is possible to sort report records into either in an ascending or descending sequence based on one or more key-fields. For example a report of customer sales records can be sorted into descending sequence based on the current month's sales amounts. Sequenced in this way, the customers with the largest sales amounts are listed first, thus calling the managers attention to them. Such a report might be titled a fast moving items report.
- **Group exceptions together:** the report can be designed so that the managers can look into certain areas for the exceptions. The edge accounts receivable report list receivables in separate columns. If the manager is interested in receivables over 90 days old, this column is scanned to pick them out.
- **Show the variance from the norm:** actual activity is compared to planned activity and the difference is shown as a variance. The managers scan the two variance columns to pick out the very large and the very small accounts.

## 4. MATHEMATICAL MODELING

Model as a body of information about a system gathered for the purpose of studying the system. There are four types of models,

1. Physical
2. Narrative
3. Graphs
4. Mathematical

**Physical:** physical model is one that exists in a 3 dimensional form, for example a clay model of a new automobile developed by designers.

**Narrative:** any written or spoken description of something can be considered as a narrative model.

**Graph:** a graphic model is a diagram, usually two dimensional. Examples are graphs and charts.

## MIS Unit I

**Mathematical:** mathematical models use symbolic notations and mathematical equations to represent a system. The system attributes are represented by variables and the activities are represented by mathematical functions that interrelates the variables. A mathematical model can be represented by three dimensions,

1. The influence of time
  - Static
  - Dynamic
2. The degree of certainty
  - probabilistic
  - deterministic
3. The ability to achieve optimization.
  - Optimizing
  - Sub-optimizing

### **Static or dynamic models**

A **static model** does not include time as a variable. Eg: in marketing, there is a balance between supply and demand for the commodity. Both factors depend upon price: a simple market model will show what is the price at which the balance occurs?

A dynamic mathematical model allows the changes of system attributes to be derived as a function of time. Eg. The equation, derived to describe the behavior of a car wheel.

### **Probabilistic or deterministic models**

A probability is the chance that something will happen. Probabilities range from 1 to 0. A model that includes probabilities is called a probabilistic model. Otherwise it is deterministic model.

### **Optimizing or sub optimizing models**

An optimizing model is one that selects the best solution among the alternatives. For a model to be able to do this, the problem must be very well structured. A sub-optimizing model, permits the manager to enter a set of decisions, once this step is completed the model will project an outcome. The model does not identify the decisions that will produce the best outcome but leaves that task to the manager.

### **Advantages and disadvantages of modeling**

#### Advantages

- Can be a learning experience
- Speed allows consideration of more options
- Provides predictive power
- Less expensive than trial-and-error method

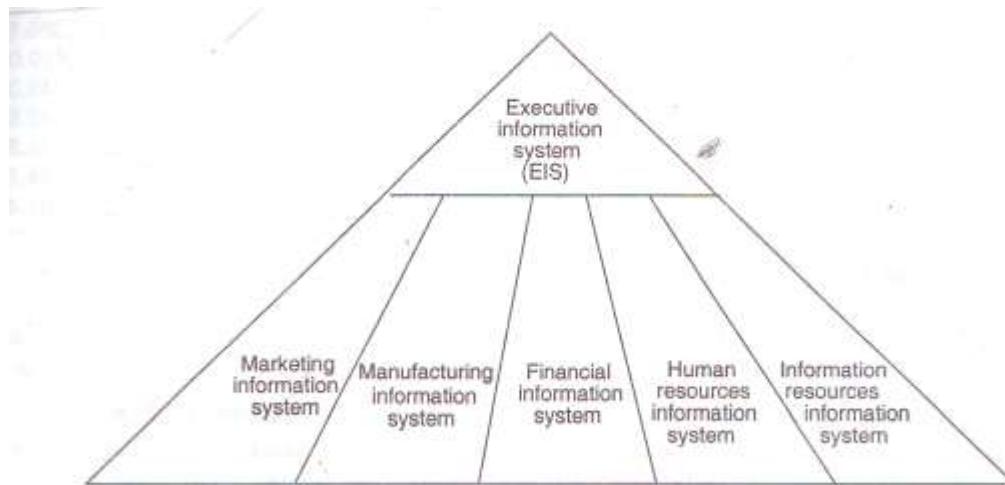
#### Disadvantages

- Difficult to model a business system
- High degree of mathematical skills required

### Steps of model construction

- Define the problem, decision or scenario and the factor that influence it.
- Select criteria to guide the decision, and establish objectives.
- Formulate a model that helps management to understand the relationships between the influential factors and the objectives the firm is trying to achieve.
- Collect the relevant data while trying to avoid the incorporation of superfluous information into the model.
- Identify and evaluate the alternatives.
- Select the best alternative.
- Implement the alternative.

### 5. CONCEPT OF ORGANIZATIONAL INFORMATION SUB-SYSTEM



**Fig.1.5 Organizational information systems**

The above figure illustrates the subdivision of the MIS into organizational subsystems. Organizational informational systems are a logical rather than a physical way of thinking about the MIS. MIS concept was so well received that managers in the functional areas began incorporating software and data into the systems to meet their own needs.

**Marketing** was the first area to conceive the notion of a functional information system, and considerable effort was spent in describing how the computer could be applied to the entire range of marketing operations, for example sales, accounts receivable, accounts payable.

The **manufacturing** area also embraced computer processing and applied the technology as both a conceptual information systems and as a component in the physical manufacturing system. Such technologies as factory robots and computer controlled conveyor systems are examples of how physical manufacturing processes have been computerized. For example, design, location and layout, product design, operation production planning and control, materials management, quality control, cost control.

## MIS Unit I

The **financial** area did not embrace the title of financial information systems, although computer-based information systems in that area are commonplace. For example, general ledger, payroll, accounts payable, cash books, budget control, taxation, costing.

A functional area that did adopt the information system title was **human resources**, and it represents the area where most current attention is being focused. For example recruitment, promotion, retirement, transfer, leaves management, training and skill development.

**Information** resource system describes how the computer could be applied to the entire range of information collection. For example, information about the competitors, government, banks etc.

Much current attention is also being focused on an organizational information system aimed at a management level- the **executive information** system (EIS).

### 6. MIS AND HUMAN FACTOR CONSIDERATION

Behavioral influences that can affect the performance of employees as they perform their computer-related tasks are regarded as human factors considerations.

#### **Fear is the underlying human factor consideration**

The employees of the firms that installed the first data processing systems experienced fear. The employees feared that the computer would put them out of work.

Many employees reacted in the same way when firms embarked on their second stage of computer use by implementing MIS. The employees feared that 'Big brother' would use the systems to spy on them and invade their privacy.

**How employees expressed their fears:** if employees are afraid of the computer, they may react in various ways. The healthiest response is to openly express their fears to management. Management then has the opportunity to respond and put the fears to rest. Many times the employees will keep their fears to themselves.

**How managers expressed their fears:** managers may have fears of their own. At times the managers in one functional area do not want to share their information with others. Their reasoning is that they have gathered the information and should be able to control its uses.

#### **A program to minimizing fear**

- Use computer as a means of achieving job enhancement by giving the computer the task of doing the redundant, boring work and by giving the employees the task that challenge their abilities.
- Use formal communications to keep employees aware of firm's intentions.
- Build a relationship of trust with employees, information specialists, and management. Such a relationship is achieved by being honest about the projected impact of computer systems and in living up to promises. Such formal communications and the inclusion of users on project teams go a long way

## MIS Unit I

towards achieving trust.

- Align employees' needs with firm's objectives. First identify the employee's needs, then motivate the employees by showing them that working towards the firm's objectives also helps them meet their own needs.

### 7. MIS AND PROBLEM SOLVING

#### Problem solving

The term problem solving means the correction of things that are going wrong. The managers respond quickly to harmful influences, as well as the things that are going wrong. When managers spot performance that is going exceptionally well, they act to make it even better or to achieve the same good performance in other areas. Problem as a condition that has the potential to cause exceptionally harm or produce exceptional benefit. Problem solving then becomes the act of responding to problems so as to suppress their harmful effects or capitalize on the opportunity for benefit.

#### Importance of problem solving

Managers do things other than solve problems. In fact, problem solving might account for only a small portion of a manager's time. However, the importance of problem solving is based not on the amount of time spent doing it but rather on the consequences. A set of decisions to solve a problem might require only a few hours but could affect the firm's profits to the tune of thousands or even millions of dollars.

#### Decision making and problem solving

Decision is the selection of a strategy or action. Decision making is the act of selecting the strategy or action that the manager believes will offer the best solution to the problem.

#### Elements of a problem solving process

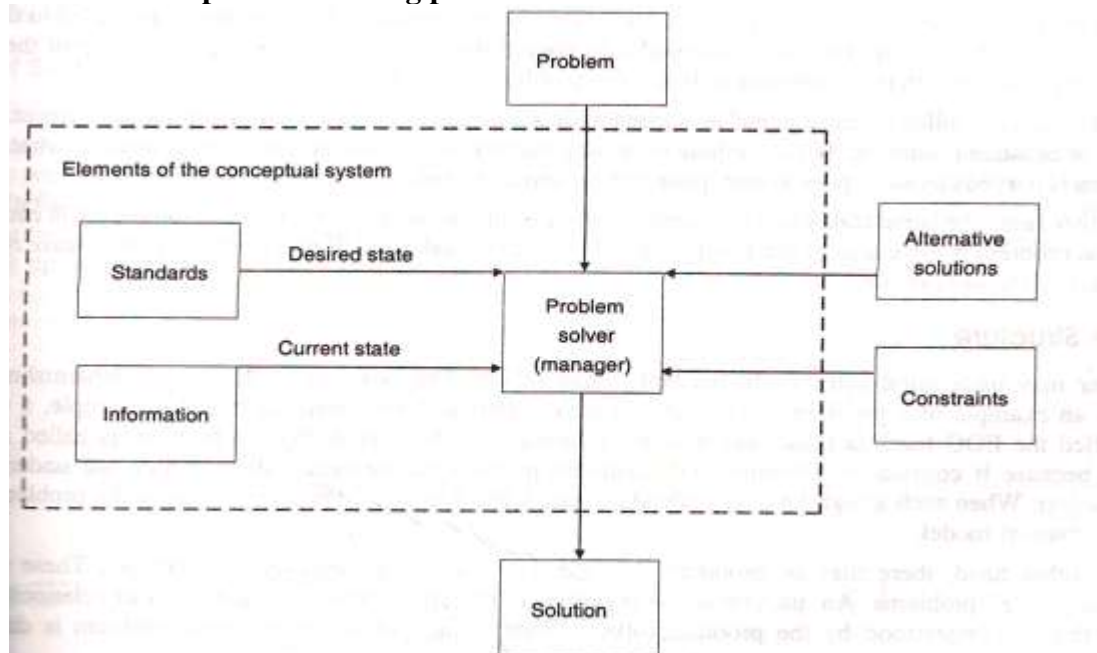


Fig.1.6 Elements of the problem solving process

## MIS Unit I

- The **solution** to a problem must best enable the system to meet its objectives.
- The **standard** describe the desired state- what the system should achieve.
- The manager must have available information that describes the **current state**- what the system is now achieving.
- If the current state and the desired state are the same, there is no problem and the manager takes no action. If the two states are different, some problem is the cause and must be solved.
- The difference between the current state and the desired state represents the solution criterion, or what it will take to bring the current state to desired state.
- For example: if the standard is to sell a minimum of 125 jackets a day and sales are averaging 75 jackets, the solution to the problem is one that will increase sales by at least 50 jackets. The 50 jackets are the solution criteria.
- It is the manager's responsibility to identify **alternative solution**. Once the alternatives have been identified, the information system can be used to evaluate each one. This evaluation should consider any possible constraints, which can be either internal or environmental. Internal constraints take the form of limited resources that exist within the firm.
- Environmental **constraints** take the form of pressure from various environmental elements, such as the government or competitors, and they act in a particular way to restrict the flows of resources into and out of the firm.
- When all of these elements exist and the manager understands them, a solution to the problem is possible.

### Problem versus symptoms

Symptoms are conditions produced by the problem. Managers must look beneath the symptoms to locate the problem's real cause. For eg: a medical doctor follows this process of sorting through symptoms to find the cause of an ailment. The patient complains of constant headaches, but something is causing the headaches, and the doctor must identify what it is. Perhaps the problem is nervous tension, poor vision, poor diet, or something else.

### Problem structure

**Structure problem** consists of elements and relationships between elements, all of which are understood by the problem solver. This type of problem can be solved by computer with manager's involvement.

An **unstructured problem** is one that contains no element or relationships between elements that are understood by the problem solver. Eg: of an unstructured problem is personnel problem that exist in a department, where the employees cannot work as a team because of behavioral differences. The employees clash because of conflicting personalities, different cultures, different goals. Manager has to do most of the work in solving unstructured problem

**Semi-structure** problem is one that contains some elements or relationships that are understood by the problem solver. Example of this type of problem is selection of a location to build a new plant. Some of the elements such as land cost, taxes and the costs

## MIS Unit I

of shipping in raw materials, can be measured with a high degree of precision. Other elements, such as natural hazards and local attitudes, are difficult to identify and measure. The manager and the computer can jointly work towards a solution.

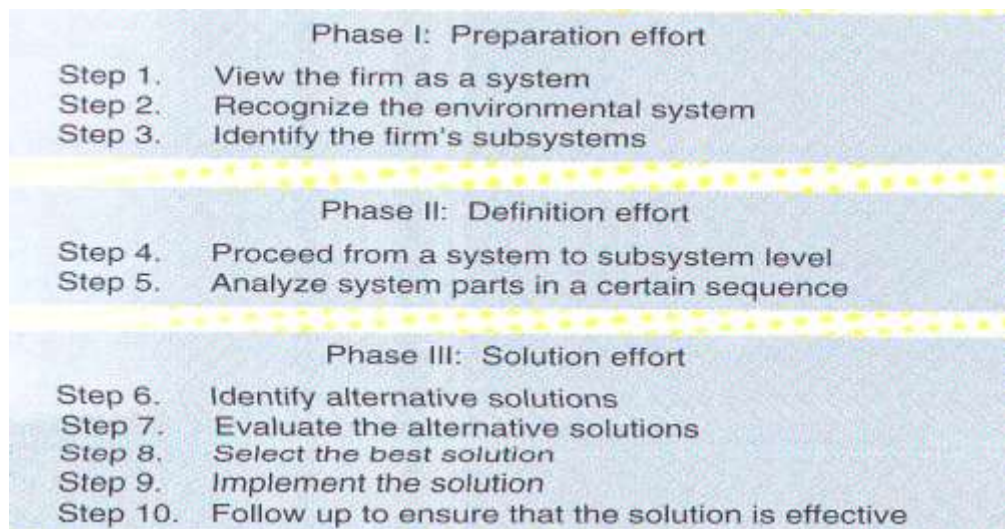
### MIS and problem solving

MIS and its organizational subsystems contribute to problem solving in two basic ways:

- Organization wide information resources
  - MIS is an organization wide effort to provide problem solving information.
  - The system is a formal commitment by executives to make the computer available to all managers.
  - Sets stage for accomplishment in other areas such as DSS, the virtual office, and knowledge-based.
- Problem identification and understanding
  - Main idea is to keep information flowing to the manager.
  - Manager uses MIS to signal impending problems and then to understand them by pinpointing their locations and causes.
- Main weakness is that it is not aimed at individual problem solvers.

### 8. SYSTEMS APPROACH

A systematic approach to problem solving is called the systems approach. Systems approach consists of three phases: Preparation effort, definition effort, Solution effort. Each phase consists of a particular type of effort that the manager must expand.



**Fig.1.7 Phases and steps of the systems approach**

### Systems approach, problem solving and decision making

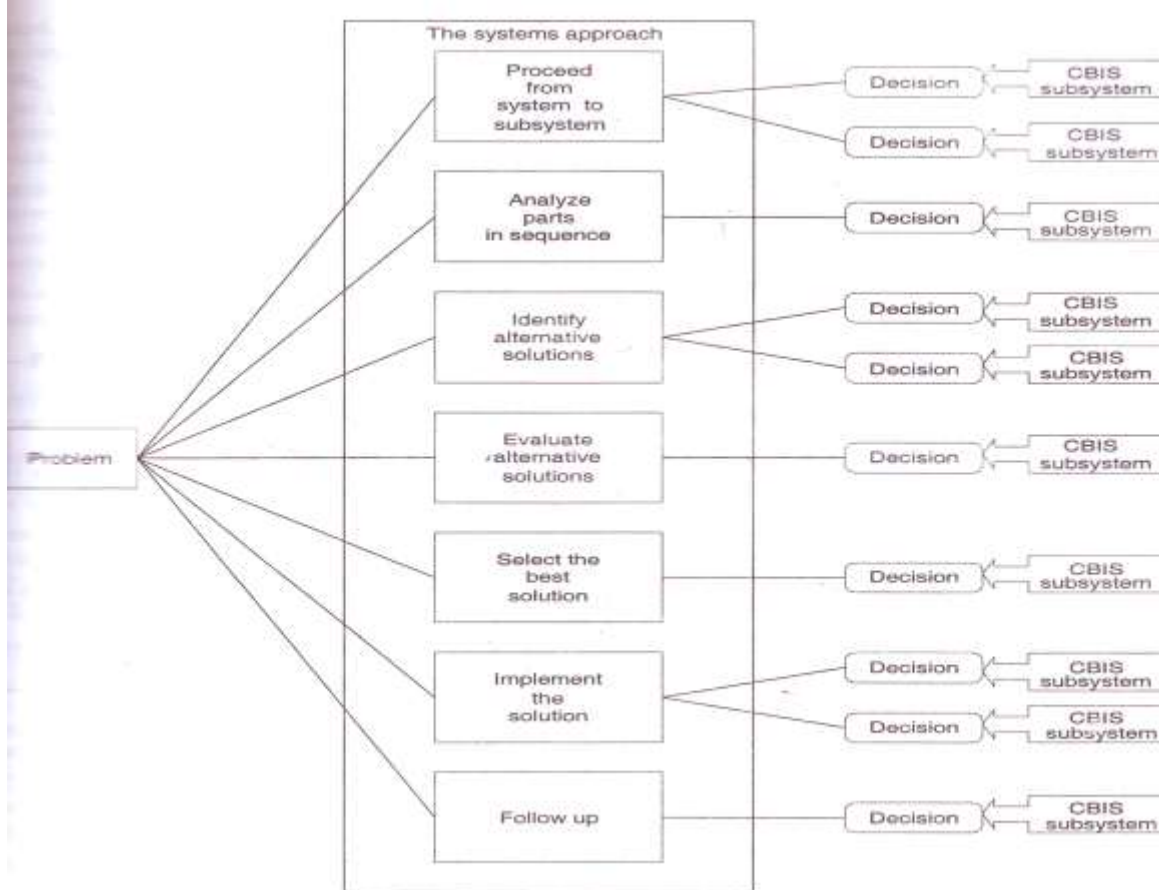
The steps of the systems approach provide a good way to categorize the multiple decisions that must be made in the process of solving a single problem. Each step under definition effort and solution effort requires at least one decision.

MIS Unit I

**Table 1.3 The systems approach requires Decision Making**

Phase	Step	Decisions
Definition Effort	4. Proceed from a system to a subsystem level.	Where is the problem? Does new data need to be gathered, or does data already exist?
	5. Analyze system parts in a certain sequence.	How will the data be gathered? What is causing the problem?
Solution Effort	6. Identify alternative solutions.	How many alternatives should be identified? Are these alternatives feasible?
	7. Evaluate the alternative solutions.	Which criteria should be used? How does each alternative measure up to each criterion? Do all criteria have equal weight?
	8. Select the best solution.	Is there enough information to make a selection? Which alternative measures up best to the criteria? When should this solution be implemented?
	9. Implement the solution.	How should this solution be implemented? Who should perform the evaluation?
	10. Follow up to ensure that the solution is effective.	How well is the solution meeting the objectives?

**Systems approach and CBIS (computer based information system)**



**Fig.1.8 Systems of the CBIS help the manager solve a problem**



The CBIS can be used as a support system when applying the systems approach. A CBIS sub-systems such as a DSS (decision support system), KBS (knowledge based system), VO (virtual office), can provide support to a separate decision. The systems approach serves as a bridge between the problem and the CBIS, providing a framework for the various decisions.

### **Phase 1: Preparation effort**

Preparation effort prepares the manager for problem solving by providing systems orientation.

#### **Step 1: View the firm as a system**

You must be able to see your firm as a system. This can be accomplished with the use of the general systems model. You must be able to see how your firm fits the model.

#### **Step 2: Recognize the environmental system**

The firm's relationship to its environment is also important. The environmental elements provide an effective way of positioning the firm as a system in its environment.

Environments elements are: Global community, Competitors, Customers, venders, Stockholders, Labor unions, Government, Suppliers, Financial community.



**Fig.1.9 Environmental elements**

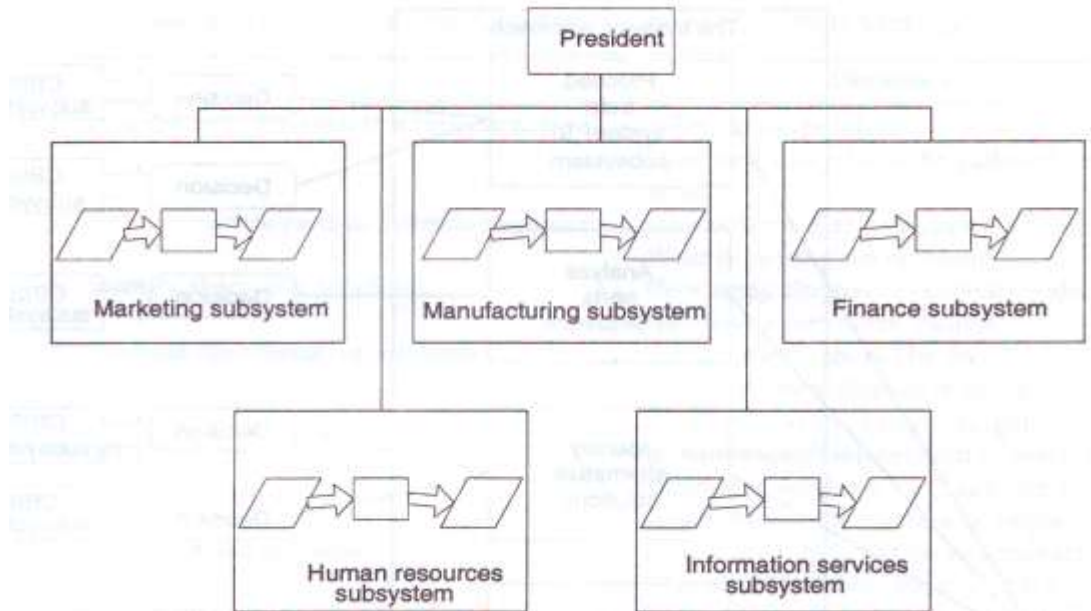
#### **Step 3: Identify the firm's subsystem**

The major subsystem of the firm can take several forms. The easiest for the managers to see are the functional area.

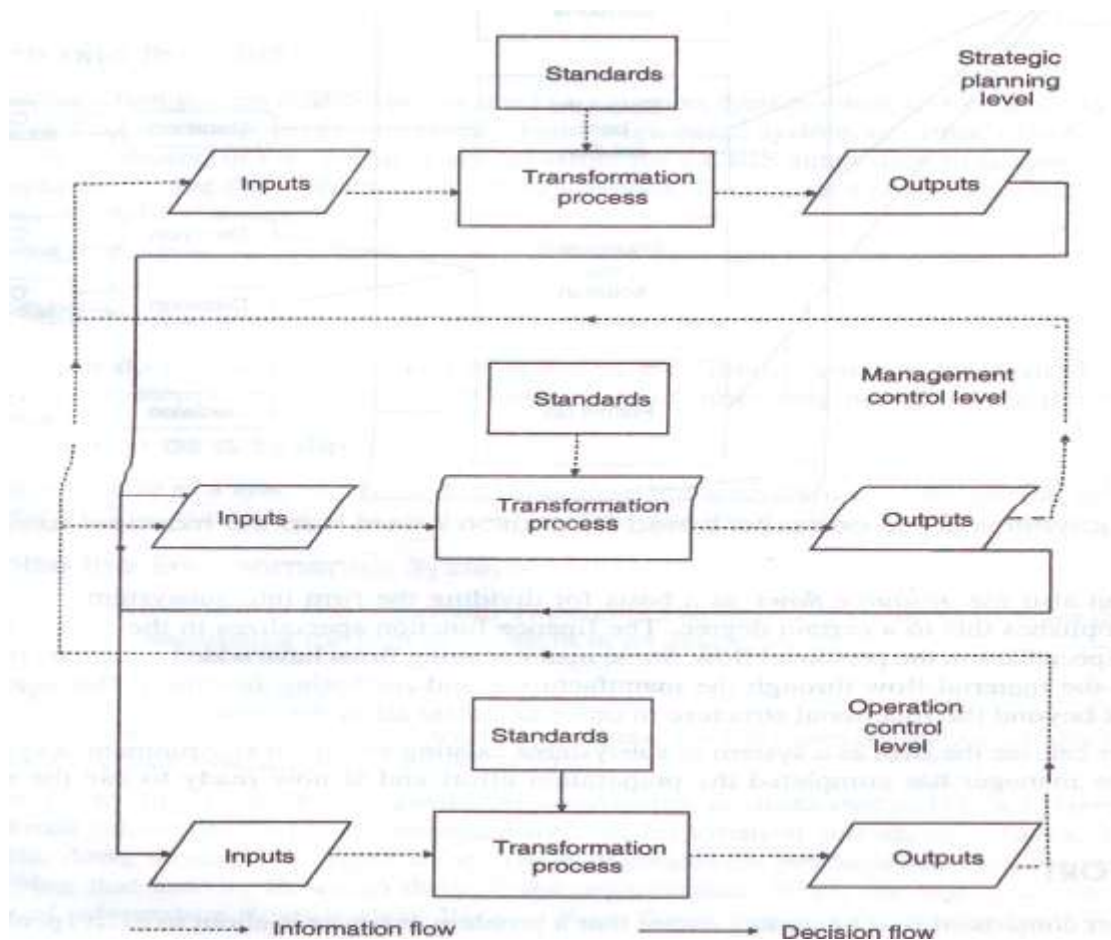
The manager can also regard the levels of management as subsystem. Here the subsystems have a superior subordinate relationship and are connected by both information and decision flows. Top management makes decision that filter down

## MIS Unit I

through the organization. The firm creates the products and services on the lower level, and information describing that activity flows up through the organization. When the manager sees the firms in this manner, the importance of information flows is clear.



**Fig.1.10 Each functional area is a subsystem**



**Fig.1.11 Each management level is a subsystem**

**Phase 2: Definition effort**

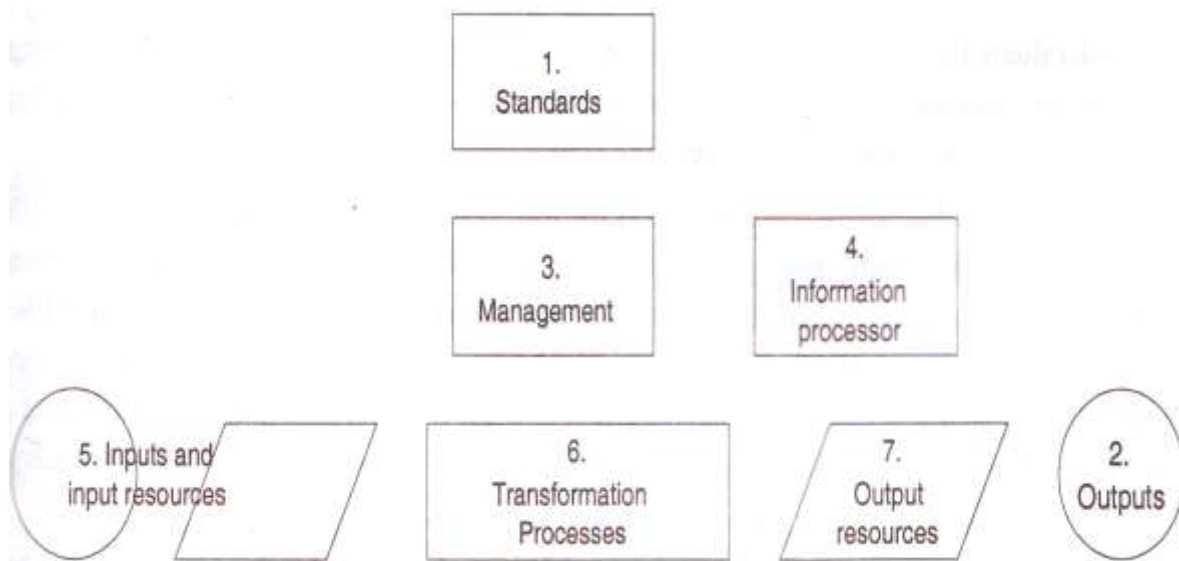
This effort consists of identifying a problem to be solved and then understanding it.

**Step 4: Proceed from a system to a subsystem level**

As the manager seeks to understand the problem, the analysis begins on the system for which the manager is responsible. The system can be the firm or one of its units. The analysis then proceeds down the system hierarchy, level by level. The manager first studies the position of the system in relation to its environment. Is the system in equilibrium with its environment? Are resources flowing between the system and its environment in the desired manner? Is the system meeting its objectives of providing products and services to the environment?

**Step 5: Analyze system parts in a certain sequence**

As the manager studies each system level, the system elements are analyzed in sequence. The sequence is shown in Fig., which shows the priority of each element in the problem-solving process.



**Fig.1.12 Each part of the system is analyzed in sequence**

**Element one- Evaluate Standards:** the performance standards for a system are usually stated in the form of plans, budgets and quotas. Management sets the standards and must ensure that they have certain characteristics:

- The standards must be valid.
- The standards must be realistic.
- The standards must be understandable to those who are expected to meet them.
- The standards should be measurable.

**Element two- compare system outputs with standards:** once the manager is satisfied with the standards, he or she next evaluates the outputs of the system by comparing them with the standards. If the system is meeting its standards, there is no need to continue

## MIS Unit I

with the systems approach to problem solving. If the system is not meeting its standards, the manager must identify the cause.

**Element three- Evaluate Management:** a critical appraisal is made of the system's management and organizational structure. Does a management team exist in terms of both the required quantity and quality? Are there enough managers, and do they have the right skills and abilities?

**Element four- Evaluate the Information Processor:** it is possible that a good management team is present, but the team is simply not getting the information that it needs. If this is the case, the needs must be identified and an adequate information system must be designed and implemented.

**Element five- Evaluate the Inputs and the Input Resources:** when this level of system analysis is reached, the conceptual system is no longer a concern, and the problem exists within the physical system. An analysis is made of both the physical resources in the input element of the system and the resources flowing through that element from the environment. Example is the firm's receiving dock adequately staffed, and do materials ordered from suppliers arrive on time?

**Element six- Evaluate the transformation processes:** inefficient procedures and practices might be causing difficulties in transforming the inputs into outputs. Automation, robotics, computer-aided design and computer-aided manufacturing (CAD/CAM), and computer integrated manufacturing (CIM) are modern day examples of efforts to solve transformation problems.

**Element seven- Evaluate the output Resources:** in analyzing element two, we paid attention to the outputs produced by the system. Here we consider the physical resources in the output element of the system. Examples of such resources are the finished goods storeroom, shipping dock personnel and machines, and the fleet of delivery trucks.

### **Phase 3: Solution effort**

Involves identifying alternative solutions, evaluating them, selecting the one that appears best, implementing that solution and following up to ensure that the problem is solved.

#### **Step 6: Identify alternative solution**

The manager identifies different ways to solve the same problem. This is easier for an experienced manager, who can apply solutions that have worked in the past, but creativity and intuition also play important roles. An example of how alternative solutions are identified, assume that the problem is a computer that cannot handle the firm's increasing volume of activity. Three alternative solutions are identified:

- a) add more devices to the existing computer to increase its capacity and speed
- b) replace the existing computer with a larger computer
- c) replace the existing computer with a local area network of smaller computers

## MIS Unit I

### **Step 7: Evaluate the alternative solution**

All of the alternatives must be evaluated using the same evaluation criteria- measures of how well an alternative would solve the problem. It is necessary to consider both the advantages and the disadvantages of each alternative. Evaluation criteria include

- a) Cost of operation
- b) User training
- c) Responsiveness
- d) Data security
- e) Ability to adapt to changing user needs

### **Step 8: Select the best solution**

After evaluating the alternatives, it is next necessary to select the one that appears to be best. There are three ways that managers go about selecting the best alternative:

**Analysis:** a systematic evaluation of options, considering their sequences on the organization's goal.

**Judgment:** the mental process of a single manager.

**Bargaining:** negotiations between several managers.

### **Step 9: Implement the solution**

The problem is not solved simply by selecting the best solution. It is necessary to implement the solution. It would be necessary to install the required computing equipment.

### **Step 10: Follow up to ensure that the solution is effective**

The manager should stay on top of the situation to make certain that the solution achieves the planned performance. When the solution falls short of expectations, it is necessary to retrace the problem-solving steps to determine what went wrong. Then another try is made. This process is repeated until the manager is satisfied that the problem has been solved.

**THE END**