UNIT I

INTRODUCTION

Definition – Importance of Information System – Functions of MIS – Objectives of MIS – Components of Information System – MIS for Operations: Marketing IS, Manufacturing IS, Human Resource IS and Financial IS

Basic concepts

Overview of Management Concepts

Every business unit has some objectives of its own. These objectives can be achieved with the coordinated efforts of several personnel. The works of a number of persons are properly coordinated to achieve the objectives through the process of management.

Management is a vital aspect of the economic life of man, which is an organised group activity. It is considered as the indispensable institution in the modern social organization marked by scientific thought and technological innovations. One or the other form of management is essential wherever human efforts are to be undertaken collectively to satisfy wants through some productive activity, occupation or profession.

It is management that regulates man's productive activities through coordinated use of material resources. Without the leadership provided by management, the resources of production remain resources and never become production.

Management is the integrating force in all organized activity. Whenever two or more people work together, to attain a common objective, they have to coordinate their activities. They also have to organize and utilize their resources in such a way as to optimize the results.

Management is usually defined as planning, directing and controlling the business operations. Management is the process of allocating and organizations input including human and economic resources by planning, organizing, directing and controlling for the purpose of producing goods or services desired by customers so that organizational objectives are accomplished.

Functions of Management

Management has been defined as a process of getting things done through others. This process is identified in a set of functions performed by managers to accomplish the goals. A manager is thus someone who defines, plans, guides, helps out, and assesses the work of others, frequently people for whom the manager is accountable in an organization. The following mentioned management functions will involve creative problem solving.

Planning: According to Terry and Franklin, "planning is selecting information and making assumptions concerning the future to put together the activities necessary to achieve

organizational objectives." Planning includes both the broadest view of the organization, e.g., its mission, and the narrowest, e.g., a tactic for accomplishing a specific goal.

Organizing: Organizing is the classification and categorization of requisite objectives, the grouping of activities needed to accomplish objectives, the assignment of each grouping to a manager with the authority necessary to supervise it, and the provisions for coordination horizontally and vertically in the organization structure. The focus is on separation, coordination, and control of tasks and the flow of information inside the organization. It is in this function that managers allocate authority to job holders.

Directing: Direction is telling people what to accomplish and seeing that they do it to the finest of their capability. It includes making assignments, corresponding procedures, seeing that mistakes are corrected, providing on the job instruction and, of course, issuing orders." The purpose of directing is to control the behaviour of all personnel to accomplish the organization's mission and objectives while simultaneously helping them accomplish their own career objectives.

Staffing: Staffing function requires recognition of human resource needs, filling the organizational structure and keeping it filled with competent people. This function includes recruiting, training; evaluating and compensating are the specific activities.

Controlling: "Control is the course of action that measures present performance and guides it towards some predetermined goal. The quintessence of control lies in checking existing actions against some desired results determined in the planning process."

LEVELS OF MANAGEMENT

According to the expert there are three types of level of management:

i) Top Level Management

ii) Middle Level Management

iii) Low Level or Operative Management

*Figure 1 **LEVELS OF MANAGEMENT***
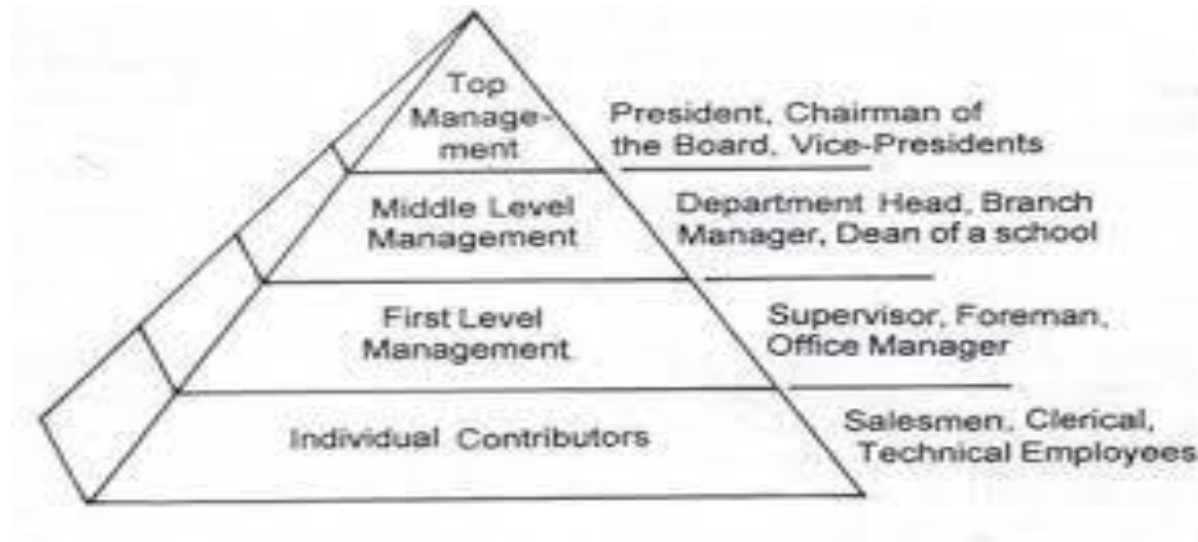
Top Level Management

Top level management consists of board of directors, managing directors or executive committee members.

Objectives of Top Level Management include the following.

☐ Setting key objectives, policies and identifying factors essential for the development of the organization.

☐ Making appointments to the top position of the organization such as managers department heads etc.

☐ Reviewing the work of different personnel in various levels.

Middle Level Management

Middle level management consists of managers of various departments such as productions, sales, marketing, resource, finance etc.

Objectives of Middle Level Management include the following.

☐ Follow the rules and policies formulated by the top-level management.

☐ Motivating personnel for higher productivity.

☐ Collecting detail analysis reports from the various departments.

☐ Mutual understanding with other departments in the organization.

☐ Recommendations to the top-level management.

Low Level Management.

Low level management consist of supervisors, daily workers etc. Follow the rules and guidelines made out by the top level authentic of the organization. Some of the functions of Lower Level Management include the following.

☐ To issue orders and instructions to the workers and to supervise and control their work

☐ To classify and assign jobs to the workers

☐ To direct and guide the workers about work procedure

☐ To arrange for the necessary tools, equipment, materials etc., for the worker

☐ To solve the problems of workers

☐ To inform the management about the problems of workers which are not solved at this level?
☐ To maintain discipline among the workers and to develop in them the right approach to work.
☐ To maintain good human relations.
☐ To build a high group morale among the workers.

Concept of a System
A System is a group of interrelated components working together toward a common goal by accepting inputs and producing outputs in an organized transformation process.

System Concepts
The concepts of a system are Technology, Application, Development and Management.

a. Technology.
Computer networks are systems of information processing components that are a variety of hardware, software and telecommunication technology.

b. Application.
That electronic business and commerce application involves interconnected business information system

c. Development.
That developing way to use IT in business includes designing the basic component of information system.

d. Management.
Managing IT emphasize the quality, strategic business value and security of an organization in information system.

Components of a System
There are three basic components of a system, they are
a) Input,
b) Processing and
c) Output.

a. Input.
Input involves capturing and assembling elements that enter to the system to be processed. Some of the inputs are raw materials, energy, data etc.

b. Processing.
It involves transformation process that converts input to output.

c. Output.
It involves transforming element that has been produced by a transformation process to their ultimate destination.

Types of System
a. Dynamic System:
When the interrelated component of the system interacts with each other and this controlled by management then it is known as Dynamic System.

b. Cyber-native System

Dynamic System implementing the concept of feedback and control is known as Cyber-native System.

c. Open System

A system got interacts with other system in its environment by exchanging input and output with its environment

d. Adoptive System

A System having the ability to change itself and its environment in order to survive is called an Adoptive System.

Data, Information, Knowledge, and Wisdom

Let us consider the case of a retail store that is trying to increase sales. Some of the data available includes sales levels for the last 36 months, advertising expenses, and customer comments from surveys. By itself, this data may be interesting, but it must be organized and analyzed to be useful in making a decision.

For example, a manager might use economic and marketing models to forecast patterns and determine relationships among various advertising expenses and sales.

The resulting information (presented in equations, charts, and tables) would clarify relationships among the data and would be used to decide how to proceed It requires knowledge to determine how to analyze data and make decisions.

Education and experience create knowledge in humans. A manager learns which data to collect, the proper models to

apply, and ways to analyze results for making better decisions. In some cases, this knowledge can be transferred to specialized computer programs (expert systems).

Wisdom is more difficult to define but represents the ability to learn from experience and adapt to changing conditions. In this example, wisdom would enable a manager to spot trends, identify potential problems, and develop new techniques to analyze the data.

Data Versus Information

Often the words data and information are used interchangeably. Yet they don't mean the same thing. It is important to understand the difference between data and information.

- Data is raw material.
- Data that is analysed, summarised or processed only becomes information if the user understands it.
- Data means the words, numbers, graphics that are entered into the computer by the user to describe people, events, and things.
- Information is knowledge and understanding that is usable by the recipient. It must reduce uncertainty and have a
- surprise value. If it doesn't have these attributes, as far as the user is concerned, it contains processed data, not information.

- Information means the words, numbers, graphics that are displayed or printed as the basis for making decisions.
- Often information is the result derived by processing data.

Data capture, handling, entry, processing and dissemination incur costs and do not directly produce value. Value only occurs when information is used to improve decision-making. Value of information = change in decision making caused by the information being available minus the cost of producing this information That is why information has to be managed as a company resource, just like raw materials, people or energy.

Characteristics of Information
Now, let us discuss about the characteristics of good information
- **Timeliness:** Information must reach the user in a timely manner, just when it is needed; not too early, because by the time it is used it would be out-of-date; not too late because the user will not be able to incorporate it into his/her decision-making.
- **Appropriateness:** Information must be relevant to the person who is using it. It must be within the sphere of his/her activities so that it can be used to reduce uncertainty in his/her decision-making.
- **Accuracy:** Accuracy costs. We don't always need 100% accurate information so long as we know the degree of accuracy it represents (eg: + or - 5%).
- **Conciseness:** Information should always contain the minimum amount of detail that is appropriate for the user. Too much detail causes information overload.
- **Frequency:** Frequency is related to timeliness. Too often the information presented is linked to the calendar (end of the week, beginning of the month); its frequency should be synchronized with the timing of the decision making of the user.
- **Understandability:** The *format* and *presentation* of information are very important. Some people prefer tabular information, whereas others may need it in a graphical form. Also, the use of colors enhances the understandability of what is presented.
- **Relevant:** It pertains to the particular problem. What data is relevant depends on the decision-making model used. E.g. university admissions officials may choose to consider the results of some high-school test irrelevant, if they believe that it does not improve the chances of some applicant later becoming a successful student.
- **Complete:** All the relevant parts are included. E.g. marketing data about household incomes may lead to bad decisions, if not accompanied by consumption habits of the target population.
- **Current:** Decisions are often based on the latest information available
- **Economical:** The costs of gathering information should be justified by the overall benefits

Information Concepts

Data is a raw material for information systems. Collecting data costs money and hence one must collect necessary and sufficient data. Data is generally input to the information systems for processing. Data size is also growing but is useless unless it is processed to create information.

Information is processed data, used by managers to initiate actions and to run the organization efficiently. The data processed by machines gives information

Types of Information

☐ *Strategic:* Needed for long range planning and directions. This is less structured.

☐ *Tactical:* Needed to take short range decisions to improve profitability and performance.

☐ *Operational:* Needed for day-to-day operations of the organization. Eg: Daily Sales, Billing.

☐ *Statutory:* Needed by law to send to government authorities. Eg: Sales tax return.
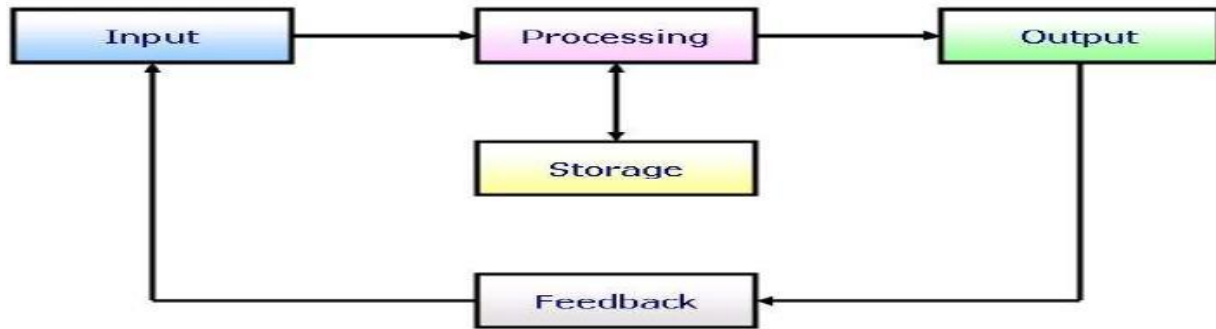
Functions of Information
1. **Reduction of Uncertainty:** Uncertainty exist where there is less than perfect knowledge. Rarely, if ever is their perfect knowledge but relevant information helps to reduce the unknown.
2. **An aid to monitoring and control**: By providing information about performance and the extent of deviations from planned level of performance, management are better able to control operation.
3. **As a means of communication**: Managers need to know about developments, plans, forecasts, impending changes and so on.
4. **As a memory supplement**: By having historical information about performance, transactions, results of past actions and decisions available for reference, personal memories are supplemented.
5. **As aid to simplification**: By reducing uncertainty and enhancing understanding, problems and situations are simplified and become more manageable.

Information System
Meaning: An information system can be any organized combination of people, hardware, software, communication software and data resource that collects transformation or screening the information in an organization.
Definition: *An information system can be defined as a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making, coordination and control in an organization.*
*Figure 2 Structure **of information system***

Some examples of information systems include the following.

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

a. Feedback and control

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

b. Feedback.

Feedback is a data about the performance of a system.

c. Control.

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

Components of Information System

a. People Resources

People are required for the operation of all information system.

People Resources divided into two types

i) End-Users

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

Ex: Accounts, Sales Persons, Customers and Managers.

ii) Information system specialist

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

Ex: System Managers, Programmers, Computer Operation.

b. Data Resources

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

i) Database

Database holds processed and organized data.

ii) Knowledge Base

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It holds knowledge in a variety of forms such as facts, rules, and case examples.

c. Software Resources

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

i) Program:

Set of operating instructions the direct and computer hardware.

ii) Procedure

Set of Information processing instructions needed by people.

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

d. Hardware Resources

Include all physical devices and materials used in information processing.

It has also two types

i) Machines

Ex: Computer, Video Monitor, Scanner.

ii) Media

Hardware in computer-based Information system.

Ex: Floppy Disk, Magnetic Tape and Optical Disk.

Computer System

Ex: Microcomputers, Midrange Computers System, Large Mainframe

Computer Peripheral: Ex: Mouse, Key Board.

e. Network Resources:

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

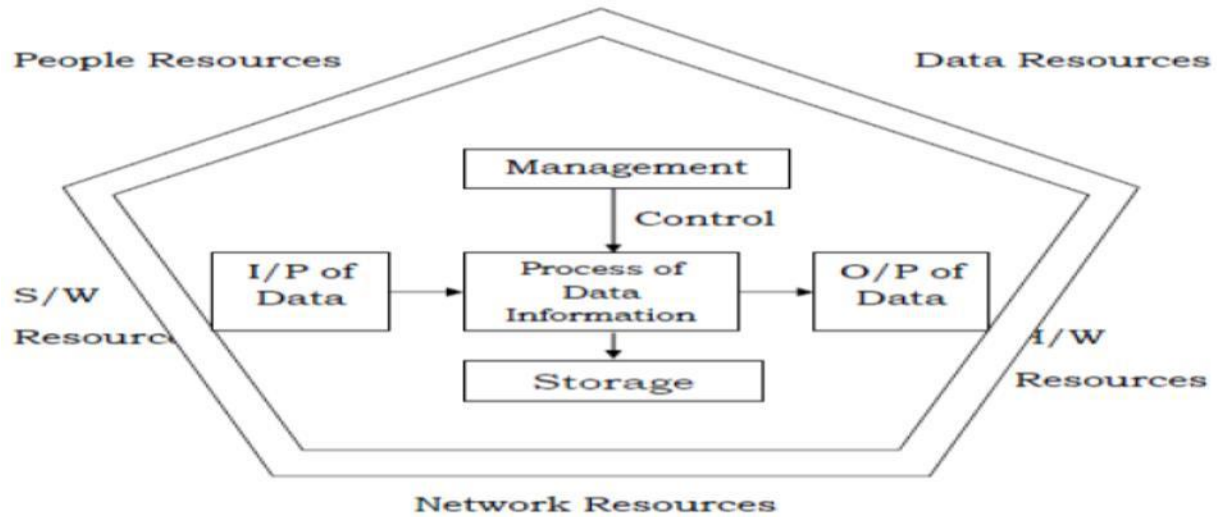**i) Communication Media:**

Ex: Co-axial Cable, Twisted Paired Wire, Fibre Optics Cable, Microwave System and Communication Satellite System.

ii) Network Support:

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

Ex: Modems, Internet Browser and Communication Control Software.

*Figure 3 **Components of Information System***

Need for Information Systems

The information system is very important for the internet technology and the traditional business concerns and is really the latest phase in the ongoing evolution of business. All the companies need to update their business, infrastructure and change way they work to respond more immediately to customer need.

A first step in designing and developing an MIS is to assess the information needs for decision making of management at different hierarchical levels, so that the requisite information can be made available in both timely and usable form to the people who need it. Such assessment of information needs is usually based on personality, positions, levels and functions of management.

Information systems are needed when timely processing for fast action is needed; same data has to be processed in different ways and when organizations require innovative processing.

Figure 4 Management hierarchy and information needs
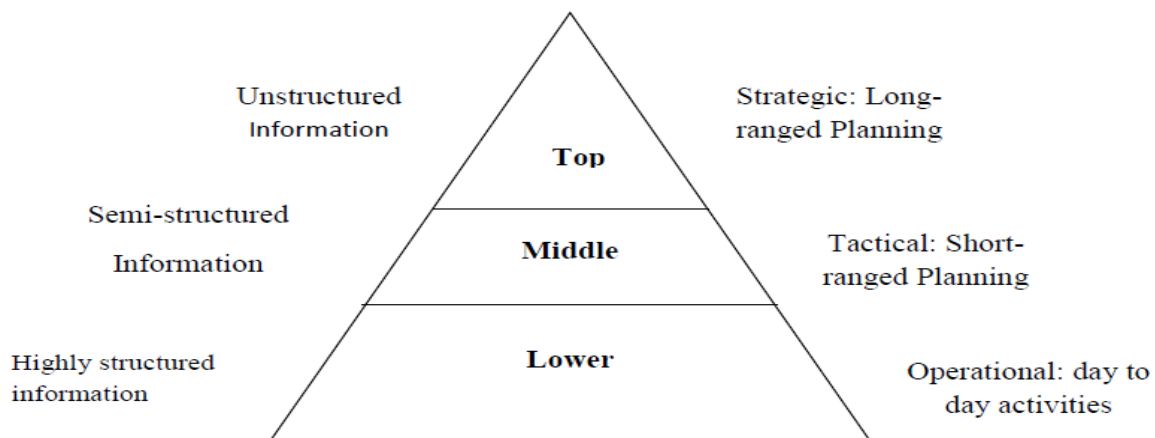
Functional areas of management are as follows

A. Production

B. Marketing

C. Materials – purchase, stores

D. Finance –accounts

E. Human Resource Development (HRD)

F. Research and Development (R&D)

Information for Management

Different types of information required for various departments of an enterprise can be categorized as follows.

Production Management

The following type of information is needed in production management:

Strategic Information:

1) Yearly and monthly production quotas and alternate schedules

2) Policies on machine replacement, augmentation and modernization

3) Identifying best product mix.

Tactical Information

1) Identifying and controlling areas of high cost.

2) Identifying critical bottlenecks in production.

3) Identifying alternate production schedules based on tools, machines etc.

4) Performance measures of machines to decide replacement.

Operational Information

1) Monitoring up to date production information by examining assemblies, detecting likely shortages and giving early warning.

2) Scheduling better production dynamically.

3) Preventive maintenance schedules.

4) Monitoring tool, machine and personnel availability

Marketing Management

The following type of information is needed in Marketing Management:

Strategic Information:

1) Search for new markets and marketing strategies.

2) Analysis of competitor's strategy

3) Technology and demographic forecasts and product changes

Tactical Information:

1) Advertising techniques and analysis of their impact.

2) Customer preference surveys.

3) Correlation of prices and sales.

4) Sales force deployment and targets.

5) Exploring alternate marketing channels.

6) Timing of special sales campaigns.

Operational Information:

1) Sales analysis by regions, customer class, sales person.

2) Sales target versus achievement.

3) Market share and trends.

4) Seasonal variations.

5) Effect of model changes.

6) Performance of sales outlets

7) Costs of campaigns and benefit

Material Management

The following type of information is needed in Materials Management:

Strategic Information:

1) Developing vendors for critical items

2) Determining optimal levels of inventory

3) Determining proportion of material needed

4) Reducing varieties of inventory

Tactical Information:

1) Developing vendor performance measures.

2) Determining optimal reorder levels.

3) Determining issues of items to shops versus

4) Standard needs.

5) Controlling high value of inventory.

6) Determining impact on material cost and

7) Procurement with design changes and new

8) Product introduction.

Operational Information:

1) List of excess & deficient items received.

2) List of items rejected.

3) Critical items received.

4) Stores in transit and in inspection.

5) Value of inventory in hand.

6) Goods received, rejected and issued.

2.4.4 Finance Management

The following type of information is needed in Finance Management:

Strategic Information:

1) Methods of financing.

2) Pricing policies

3) Tax planning.

Tactical Information:

1) Variations between budget and expenses.

2) Large outstanding payments/Receipts.

3) Credit and payment status.

4) Cost increases and pricing.

5) Impact of taxation on pricing

Operational Information:

1) Periodic financial report.

2) Budget status to all functional managers.

3) Tax returns.

4) Share transfers.

5) Profit and loss account.

6) Payments and receipts.

7) Payroll, provident fund accounts

Human Resource Management

The following type of information is needed in Human Resources Management:

Strategic Information:

1) Long range human resource requirements at different levels.

2) Policies on human resource development and training

3) Policies on personnel welfare and facilities

Tactical Information:

1) Performance appraisal.

2) Demographic make-up of personnel and its impact on retirement.

3) Production incentives.

4) Morale of personnel.

5) Absentee reduction.

6) Leave and overtime policies.

7) Personnel deployment policies.

Operational Information:

1) Routine assessment.

2) Skills inventory.

3) Loan/advances and recoveries.

4) Leave record.

Uses of Information System

Information system and technology including E-business and E-commerce technology and application has become vital component of successful business and organization.

It is a study of business administration and management. For a manager or a business professional it is just as important to have basic understanding of information system and any other functional area in business.

Roles of Information Systems in business

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

a) **Support the Business Process:** Treats inputs as a request from the customer and outputs as services to customer. Supports current operations and use the system to influence further way of working.

b) **Support Operation of a Business Organization**: An IS supports operations of a business organization by giving timely information, maintenance and enhancement which provides flexibility in the operation of organizations.

c) **Support Decision Making:** An IS supports the decision making by employee in their daily operations. It also supports managers in decision making to meet the goals and objectives of the organization. Different mathematical models and IT tools are used for the purpose evolving strategies to meet competitive needs.

d) **Strategies for an Organization:** Today each business is running in a competitive market. An IS supports the organization to evolve appropriate strategies for the business to assent in a competitive environment

Concept of Management Information System

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

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

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

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

Information: Information is considered as valuable component of an organization. Information is data that is processed and is presented in a form which assists decision maker.

System: A system is defined as a set of elements which are joined together to achieve a common objective. The elements are interrelated and interdependent. Thus, every system is said to be composed of subsystems. A system has one or multiple inputs, these inputs are processed through a transformation process to convert these input(s) to output.

Definition of Management Information System

G.B. Davis defined a Management Information System (MIS) is "an integrated man/machine system for providing information to hold up the operations, management and decision-making functions in an organization." Here the system utilizes hardware and software, manual procedures, management decision model and data base.

An MIS need not be wholly computer based; it is however inevitable that the information deriving from the high volume of data in basic operational processes is computerized; what is still not so certain is whether the once off "high level" information also needed in an MIS, is best obtained using a computer.

The Management Information System (MIS) is a concept of the last decade or two. It has been understood and described in a number way.

It is also known as the Information System, the Information and Decision System, the Computer-based information System. The MIS has more than one definition, some of which are given below.

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

Thought there are a number of definitions, all of them converge on one single point, i.e., the MIS is a system to support the decision-making function in the organization. The difference lies in defining the elements of the MIS. However, in today's world MIS a computerized. business processing system generating information for the people in the organization to meet the information needs decision making to achieve the corporate objective of the organization. In any organization, small or big, a major portion of the time goes in data collection, processing, documenting it to the people. Hence, a major portion of the overheads goes into this kind of unproductive work in the organization. Every individual in an organization is continuously looking for some information which is needed to perform his/her task. Hence, the information is people-oriented and it varies with the nature of the people in the organization.

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

Apart from this there are many other thoughts over and above to this definition are as follows:

- ❖ **A management information system aims at meeting the information needs of managers, predominantly with regard to the current and past operations of the enterprise.**
- ❖ **Management information system is a system which provides precise, timely and meaningful data for management planning, analysis and control to optimize the growth of the organization.**
- ❖ **Thus, from the above definition it had been extracted that "Management Information System" (M.I.S.) is vitally concerned with processing data into information. Which is then communicated to the different departments in an organization for appropriate decision making?**
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- ❖ **The MIS is a computer-based Information System.**

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

2. **Confirmation of the validity of data and transaction.**
3. **Complex processing of data and multidimensional analysis.**
4. **Quick search and retrieval.**
5. **Mass storage.**
6. **Communication of the information system to the user on time.**
7. **Fulfilling the changing needs of the information.**

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

Objectives of MIS:

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

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

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

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

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

Characteristics of MIS

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

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

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

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

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

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

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

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

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

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

Scope of MIS in an Organization

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

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

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

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

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

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

Functions of a Management Information System

The management information system is an integrated, computerized and machine user system providing the required information to support the operation and decision making. The main functions of a management system are the following.

- **Data Capturing:** MIS captures data from various internal and external sources of an organization. Data capturing may be manual or through computer terminals. End users, typically record data about transactions on some physical medium such as paper form or enter it directly into a computer system.
- **Processing of data:** The captured data is processed to convert it into the required management information. Processing of data is done by such activities as calculating, comparing, sorting, classifying and summarizing.
- **Storage of information:** MIS stores processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organizational record. In this activity, data and information are retained in an organized manner for later use. Stored data is commonly organized into fields, records, files and databases.
- **Retrieval of information:** MIS retrieves information from its stores as and when required by various users. As per the requirements of the management users, the retrieved information is either disseminated as such or it is processed again to meet the exact demands.
- **Dissemination of MI:** Management information, which is a finished product of MIS, is disseminated to the users in the organization. It could be periodic, through reports or on-line through computer terminals.

The Role of Management Information Systems

Management information system (MIS) has become very necessary due to emergence of high complexity in business organization. It is all to know that without information no Organization can take even one step properly regarding the decision-making process. Because it is matter of fact that in an organization decision plays an essential role for the achievement of its objectives and we know that every decision is based upon information. If gathered information are irrelevant than decision will also incorrect and organization may face big loss & lots of difficulties in surviving as well.

Two main roles are played by the decision making of the managers. First it helps the managers to take decision based on the information being prepared. Second when the decision making and decisions are fixed and only the input data change, it is as a suitable repeating to support different types of manager's decisions.

- **Helps in Decision making: -** Management Information System (MIS) plays a significant Role in Decision making Process of any Organization. Because in Any organization

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decision is made on the basis of relevant Information and relevant information can only be Retrieving from the MIS.

- **Helps in Coordination among the Department: -** Management Information System is also help in establishing a sound Relationship among every person of department to department through proper exchanging of Information's.
- **Helps in Finding out Problems: -** As we know that MIS provides relevant information about every aspect of activities. Hence, if any mistake is made by the management then Management Information Systems (MIS) Information helps in Finding out the Solution of that Problem.
- **Helps in Comparison of Business Performance: -** MIS store all Past Data and information in its Database. That why management information system is very useful to compare Business Organization Performance. With the help of Management information system (MIS) Organization can analyze his Performance means whatever they do last year or Previous Years and whatever business performance in this year and also measures organization Development and Growth.

The benefits of management information systems

The management information system helps by two major ways in problem solving: An information source is provided in organization area and helps the identification of the problem. The benefit of management information system with this aim is to state the problem possibility for the managers.

Current business era is an era where information flow is very vital role than the flow of goods. As great as any of a businessman and monopolize the flow of goods, it does not mean anything if he does not have accurate, current, easily accessible and controllable in the mastering its distribution. Therefore, it is one of the company assets of modern business is highly valuable information system that has a high response rate and focus on its users from all aspects.

Information systems are built well and correctly, among others, can increase productivity, reduce the stock of material production, eliminating activities that do not have the benefit (value added), improve service and customer satisfaction, coordinating every part in the enterprise and improve the quality of management policies.

While in general the benefits of management information systems can be categorized as tangible benefits and intangible benefits.

Tangible benefits

An information system is built and maintained properly will provide tangible benefits could be seen that in fact achieved its movement through the income and expenses incurred by the company.

Indicators of success / benefits that have an impact on revenue enhancement is the increased sales in existing markets and expansion into new markets.

A good information system can be used not only for the storage of electronic data alone but must be able to support the analysis required by management. So, with the support of good

information system can be obtained then the information is accurate, reliable, current and easily accessible on the condition of the company's sales.

With the report presented by the rapid and can be accessed at any time that the decisions taken can be faster and precise on the existing market dynamics.

In terms of cost reduction can be done on reducing the amount of factual analysis of the human resources involved in the business, reducing operational costs such as supplies and overhead, the reduction of goods / material in warehouse stock, reduction of maintenance costs and providing equipment that is not too expensive.

Some examples of reduction of the number of human resources are in the process of recording financial transactions. If previously in the accounting process should be managed by five people with the implementation of the good accounting information system is done by one person enough.

This is due to the Accounting Information System which is integrated so any bookkeeping process can be processed directly from each of the relevant sections without having to go through the process of refilling the data.

Stacking material supply problems during the production is often burden of the company assets, with the implementation of supply chain management module in information systems developed greatly help solve the problem.

With the support of supply chain management then the stacking stocks of material production can be reduced to a minimum. Where, the company simply ordered to suppliers only when the inventory reaches the minimum limit.

Intangible Benefits

Often the intangible benefits of system information management are the critical point in the course of business of a company's wheel. Because it is intangible, the following aspects are often overlooked or not detected.

Increased customer satisfaction:

Good management information system will speed up the process so that, the time required to serve a customer can be faster.

Improved quantity and quality of information:

Information is an important component of business today. Who controls the information would act more responsive to changes and trends in the future.

Application of good information system will certainly generate reports compilation of data that is managed by qualified and comprehensive database. This can be achieved for each of the reporting process is executed automatically by computer machines.

Improved quality and quantity management decisions:

It is inevitable that any decision-making relies heavily on information that supports the policy to be taken. It can only be realized if information systems can provide information that is relevant, accurate, current and can be retrieved at any time.

Improved quality and responsiveness number of the competitors' condition

Aspects of business intelligence is very important since a long time with a variety of formats and needs. To reach the point of rapid and appropriate response on the dynamics of the competition will require information systems that can collect, analyze and compile the information needed by decision makers in the company.

Improved operational efficiency and flexibility:

All business owners would want these. The more efficient and flexibly an operational then this indicates the low cost to run it. This can be achieved due to cut the bureaucracy in the company after the implementation of good information systems.

Improved quality of internal and external communications:

A good information system must be supported by electronic data communication network systems that are reliable as well. With the application of good information systems, each party both inside and outside the company can exchange information more effectively and efficiently.

Improved quality of planning:

Planning is an essential process for businesses. However, any plan that will be made then of course needed the support of adequate information into practice. If not, then the plan may be disoriented and did not reach its target because of mistake information into its base.

Improved quality control and supervision:

With the information system is built and maintained properly then any activity within the business environment can be constantly monitored. Monitoring is certainly an impact on improving control over every procedure and activities occurring within the company.

Limitations of MIS

Even though MIS has many benefits it has its limitations. MIS is sometimes considered a solution for every bane within an organization. While MIS may solve some critical problems but it is not a solution to all problems of an organization.

- It cannot meet the special demands of each person. Mostly, the management information system doesn't provide exact information and the concept of decision support system was created in response to such need.
- The limitations of MIS may be stated as, The MIS is as good as its design- MIS if designed in an improper manner does not serve the management and hence is of little relevance.
- The MIS is as good as its users-if the users do not know how to leverage the information available from MIS, then MIS is of little use.
- The MIS is no good if the basic data is obsolete and outdated (for example, MIS will only facilitate garbage with information and in about garbage-out-process)

CLASSIFICATION OF INFORMATION SYSTEMS OR TYPES OF INFORMATION SYSTEM

New information systems based on Internet technology, data warehousing concepts (very large databases of operational data), or Web-enabled interorganizational systems affix to earlier, more familiar types of systems commonly discussed in the IT literature and found in most organizations. These include transaction processing systems (TPS), management information systems (MIS), decision support systems (DSS), office automation systems (OAS), and expert systems (ES). As per the encyclopedia Britannica "Information systems consist of three layers: operational support, support of knowledge work, and management support".

Figure 5 Classification of Information Systems or Types of Information System
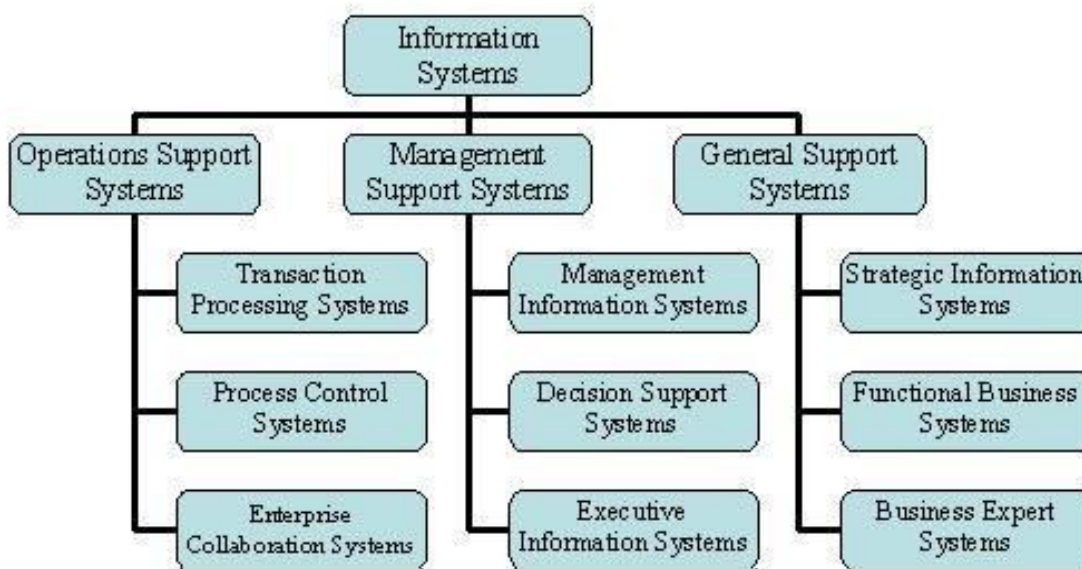
A business has several information systems:
a) Formal Information System
b) Informal Information System
c) Computer Based Information System

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

Informal Information System: it is an employee-based system designed to meet personal and vocational needs and to help in the solution of work-related problems. It also funnels information upward through indirect channels. It works within the framework of the business and its stated policies.

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

1. **Transaction Processing Systems**: Transaction processing systems handle routine information items, more often than not manipulating data in some constructive way as it enters or leaves the firm's databases. An order entry program is an example of a TPS. Reasons for TP are recording, classification, sorting, calculation, summarization, storage and exhibit of results.

2. **Management Information Systems:** Management Information systems make available a focused vision of information flow as it develops during the course of business activities. This information is constructive in managing the business.

3. **Decision Support Systems:** Decision Support systems are methodical models used to progress managerial or professional decision making by bringing significant data to a manager's notice. In many cases, these systems use the identical data as management information systems, but DSS purify the data to make it more functional to managers. It supports with exceptional and nonrecurring decisions, which are moderately unstructured. Mainly what factors to reflect on and what information are needed.

4. **Office Automation Systems:** Office automation systems endow with electronic mail, word processing, electronic filing, scheduling, calendaring, and other kinds of support to office workers. First introduced with personal computers, these "groupware" applications became essential with the extensive use of personal digital assistants. It combines word processing, telecommunications and data processing to computerize office information, draws on stored data as a result of data processing and comprise handling of correspondence, reports and documents.

5. **Knowledge Work Systems (KWS):** Information systems that give support to knowledge workers in the creation and integration of new knowledge in the organization. Knowledge work systems (KWS) and office systems provide the information needs at the knowledge level of the organization. Knowledge work systems aid knowledge workers, whereas office systems primarily aid data workers (even though they are also used expansively by knowledge workers).

6. **Executive Support Systems (ESS):** Information systems at the organization's strategic level designed to address no custom decision making through advanced graphics and communications.

## MANAGEMENT INFORMATION SYSTEM FOR OPERATIONS

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

Instead of plethora of unrelated data, an MIS combines various inputs and present integrated reports.

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

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

Figure 6 **Marketing Information System**
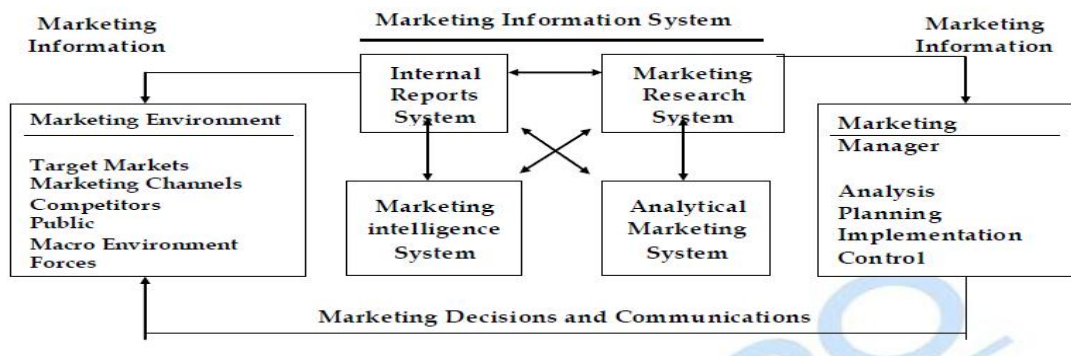
Internal Accounting System is the most basic information system used by marketing executives. It is the system that reports orders, sales inventory levels, receivable, payable. By analyzing the information, marketing managers can spot important opportunities and problems.

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

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

MIS FOR PERSONNEL MANAGEMENT

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

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

Input for Personnel Development: The following documents serve as the input in personnel information system:
- Productivity Data on the Job
- Industry Data on Manpower, Skills, Qualification
- Bio-Data of Self and Family
- Personnel Application Form
- Attendance and Leave Record
- Appraisal Form
- Appointment Letter
- Wage/ Agreement
- Record Sources of Manpower, University, Institutes, and Companies

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

1. **Establishment Records:** Establishment relates to the setting up of budgets for appropriate staff levels and grades throughout the organization. The system should encompass these budgeted posts and report on variations between actual staff numbers and the budget numbers.
2. **Recruitment Records:** Details of all vacancies and applicants should be held by the system. These should show the status of each vacancy and of each applicant and should perform as much as possible of the administrative process. This will generally mean that the system should interface with a word processing system.
3. **Personnel Records:** These relate to identification data, current and historical salary and allowances data and various employees' attributes such as grades and key dates.
4. **Pensions Records:** The system maintains all details of service entitlements of employees, contribution by both the employee and the organization to pension scheme, details of dependents, spouse and children, data required for actuarial purpose to verify the availability of the scheme and details and entitlements of employees who have become pensioners.
5. **Training Records:** These include data relating to each employees' qualification, skills and experience. The system would also hold details of internal and external training courses and its relevant details.
6. **Absence records:** The system should allow for the recording of various absence types like sick leave, special leave etc. Input of this sub-system should be automatically reflected in the establishment sub-system.
7. **Industrial relations records:** The system should hold data to assist management in negotiations and planning for alternative strategies. Much of this would be held for normal administrative purpose. It is the facility to extract the data in meaningful terms, to able to project forward and to test the impact of applying various rules and scenarios.

MIS FOR FINANCIAL MANAGEMENT

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

Input Documents:
- Receipts from customers, authorities, employees, shareholders, financial institution and others.
- Payment to suppliers, authorities, shareholders, financial institutions and others.

- Data from stock exchange on the shares prices consolidated financial results of the other companies etc.

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

Application of Financial Management Information System:

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

MIS FOR PRODUCTION MANAGEMENT

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

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

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

Inputs of Production Management Information System: The production management is conducted through innumerable transaction. They relate to planning, issuing and controlling the various task involved in the course of production.
- process Planning Sheet
- quality Assurance Rating Form

- Production Schedule
- Process Planning Sheet
- Job Cards
- Finished Goods Advice
- Material Requisition
- Customer Order
- Breakdown Advice
- Material requirement
- Production Programme

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

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

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

a. Sales department to find out what the customer wants and to compare this with what the firm can provide.

b. Design department to design new requirements and make modifications in established items either to bring them up to date or to make them meet a specific requirement of the customer.

c. Purchasing department buys the material required at the best possible price and on the most reliable delivery to make the various items either on one off basis for individual job or replenish material held in the stores on maximum and minimum levels

d. Manufacturing process sees that the parts are produced as economically as possible for delivery at the time required by the customer and to meet the standards set by the design department.