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IFTM University, Moradabad

BASIC CONCEPTS OF MANAGEMENT INFORMATION SYSTEM

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Basic Concepts of Management Information System

(As per Syllabus of State University in Uttar Pradesh for BCA, MCA, Computer Science and Other Professional Course)

By

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Preface

The course of Structured Management Information System involves planning for a proposed system analyzing the existing system, indentifying the problem and solving it by preparing deign and coding methods.

The Students of Computer Science of Various universities are always in search of relevant and well organized matter. I have tried my best to accomplish this task.

The Ultimate Aim of this book is to help the MCA, BCA, PGDCA, Engineering students of State University level. Students will find out the topic as per university syllabus. Each chapter covers examples wherever required.

This book also contains solved and unsolved sample paper for University with subjective questions. This book also contains the some important question on MIS helping students to solve all their queries.

This book first outline the steps followed in Information Systems and then describes each steps in details, introducing the techniques to be used at that point. It then discusses how techniques for describing data, process, and flow can be integrated and how models developed during analysis if information system can be converted to working system during MIS Development. However, Suggestions from readers are always welcome which could be considered in my next edition without fail.

AUTHOR

ACKNOWLEDGEMENTS

Any steps to write a book needs encouragement and practical experiences of related subject.

There are many great authors who have already written books on this topic which have been good enough. This book is result of intensive reading. It has been composed in a proper manner so as to assist the students in best possible ways. It's my pleasure to express deep gratitude to Prof. M.P Pandey Sir (Vice-chancellor, IFTM University) and Prof. Rahul Mishra Sir (Pro- Vice-chancellor, IFTM University), Prof. Intzar Mahdi Sir (Director SET, IFTM University) for extending his support and helpful hand as and when I needed. They had been a great source of inspiration for composing this material in a lucrative and lucid language. My Student Mr. Rajdeep Singh had been great help during preparation of this material. I am thankful to my colleagues who have been continuously encouraging me during my task and I will be thankful to those students who will acknowledgement and helpful appreciate my work.

Nobody has been more important to me in the pursuit of this book than the members of my family. I would like to thank my parents, whose love and guidance are with me in whatever I pursue. They are the ultimate role models. Most importantly, I wish to thank my loving and supportive wife, and my two wonderful children, Madhav, and Madhuram, who provide unending inspiration.

Syllabus

Aims and Objectives

The overall aim of this book is to provide students with an understanding at how to use and manage information system in order to revitalize business processes, improve business decision making, and gain competitive advantage

At the end of the Management Information Systems course, the student should able to

- Define the key terms.
- Describe the use and function of information systems.
- Describe and evaluate information systems development processes and techniques.
- Identify and evaluate hardware and software requirements for information systems.
- Explain the security risks associated with management information systems.

Detailed Syllabus

Unit I

Foundation of Information Systems: Introduction to information system in business, fundamentals of information systems, solving business problems with information systems, Types of information systems.

Unit II

An Overview of Management Information Systems: Definition of a management information system, MIS versus Data Processing, MIS & Decision Support Systems, MIS & Information Resources Management, Concept of a MIS, Structure of Management information system.

Unit III

Concept of planning & Control: Concept of organizational planning, The Planning Process, Computational support for planning, Characteristics of control process, The nature of control in an organization.

UNIT: IV

Business applications of information technology: Internet & electronic commerce, Intranet, Extranet & Enterprise Solutions, Information System for Managerial Decision Support. Managing Information Technology: Enterprise & global management, Security & Ethical challenges, Planning & Implementing changes.

UNIT: V

Advanced Concepts in Information Systems: Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management and Procurement Management.

Contents

About the Book:

Basic Concepts of Management Information System is one of the most important topic which must be clear to all the students of IT. This book tells us the approaches to solve a problem and make us clear with the various steps to develop a system. This Book has following salient features:

Contents of book covers

- Introduction (Basic Concepts you should know)
- Information Systems in an Organization
- Information systems development
- Information Systems, Organizations, Management and Strategy
- Enhancing Management Decision Making
- Managing Data and Information
- Redesigning the Organization with Information Systems and Managing Change

This book is also helpful for the students of MCA, BCA, and PGDCA of various Universities.

About the Author

Dr. Arvind Kumar Shukla

Dr. Arvind Kumar Shukla has an experience of more than 15 years in teaching and Industry field. Currently, He is working as Associate Professor & HoD at Department of Computer Applications, IFTM University, Moradabad. He has got is Ph.D Computer Science from Banasthali Vidyapith Rajasthan. He published more than 25 research papers in Various reputed national/International Journals. Dr. Shukla has associated with Banasthali University,Rajasthan .Dr. Shukla has consistory been active member of Academic Council, Executive Council,Board of Studies, Research Degree Committee of IFTM University, Moradabad. Dr. Shukla has supervised thesis/dissertation of more than 10 students of M.Tech & Ph.D level.

Prof.(Dr). C.K.Dixit

Prof. (Dr).C.K. Dixit M.Sc, M.Phil, Ph.D. FICS, FPAS, MMR (Singapore), D.Sc (California USA),D.Sc(south Africa) known personality, who has more than 21 years of teaching and research experience. He has served as Professor, HOD & Dean, in renowned institutes and universities. Prof. Dixit has done extensive research in the field of Nano Science, Material Science, Semiconductor, Transistor Circuitry, Microelectronics, VLSI Fabrication and Solid State Physics/Electronic Devices. Prof. Dixit has associated with IISc Bangalore, SCL Chandigarh and research laboratories in USA, UK, Netherland, Singapor, China,Turkey, Taiwan,Brazil and Germany. Prof. Dixit has published more than 76 research paper & 12 books & Prof. C.K. Dixit is currently working as Dean, Faculty of Science & Technology and Head Department of Physics at Dr. Shakuntala Misra National Rehabilitation University Mohaan Road, Lucknow. Prof. C.K. Dixit received "Best professor award" given by Dewang Mehta National Education Awards and also he received "Best educationist award" given by Economic Growth Foundation New Delhi in 2017.Young Scientist Award in 2019 in educational Summit CEGR New Delhi & Best Dean Award in 2019 by international Council of American research, International lifetime achievement award by ICAR,U.S.A. Professor dixit is advisor of different American and Indian universities. Prof. Dixit has consistory been active member of Academic Council, Executive Council, Examination committee, Board of Studies, Research Degree Committee of different Universities. He has conducted various exams of UPTU,CSJMU,RMLAU,SRMU, KMCAFU, BBAU, Lucknow University, Purvanchal University…etc and nearly all Universities of Northern and Central part of India, for UG, PG, M.Phil & Ph.D. Prof Dixit has supervised thesis/dissertation of more than 50 students of PG, M.Phil & Ph.D level, Prof Dixit is the Chairman/Member of selection committee of different state university/central university & U.P.H.E.Sc. Prof Dixit is also member of inspection committee of AICTE, NCTE, NAAC…etc and chairman of SC/ST committee, and reviewer expert committee of science and technology, Lucknow.

Prof. Dixit is committed to academic excellence and motivating approach to the faculty members and to the students.

Chapter-1

Foundations of Information Systems

1. Foundations of Information Systems

Information is an augmentation in knowledge. It adds to the general structure of concepts and facts that people know. Information depends on the context and the recipient's general knowledge for its importance.

Information systems is emerged as a discipline that is concerned with the design, construction and use of artifacts based on information technology (IT) (Weber, 1987).

Information systems are extremely critical for the expansion and survival of business organizations in competitive world. All sectors of the industry are entirely dependent on these for the management of important information and data. Small organizations to large, powerful businesses such as high street banks and central and local government need assistance of information systems to control their data.

An information system is a software system to capture, convey, store, retrieve, manipulate, or exhibit information, thus supporting people, organizations, or other software systems.

Basically, Information systems capture data from the organization (internal data) and its environment (external data). They store the database items over an extensive period of time. When particular information is required, the suitable data items are manipulated as necessary, and the user receives the resulting information. Depending on the type of information system, the information output may take the form a query response, decision outcome, expert-system advice, transaction document, or a report. Prescribed information systems rely on procedures for collecting, storing, manipulating, and accessing data in order to obtain information.

1.1 What is an Information System?

Many organizations work with large amounts of data. Data are basic values or facts and are organized in a database. Many people think of data as synonymous with information; however, information actually consists of data that has been organized to help answers questions and to solve problems. An information system is defined as the software that helps organize and analyze data. So, the purpose of an information system is to turn raw data into useful information that can be used for decision making in an organization.

1.2 Components of Information Systems

While information systems may differ in how they are used within an organization, they typically contain the following components:

- **Hardware**: Computer-based information systems use computer hardware, such as processors, monitors, keyboard and printers.
- **Software**: These are the programs used to organize process and analyze data.
- **Databases**: Information systems work with data, organized into tables and files.
- **Network**: Different elements need to be connected to each other, especially if many different people in an organization use the same information system.
- **Procedures**: These describe how specific data are processed and analyzed in order to get the answers for which the information system is designed.

The first four components are part of the general information technology (IT) of an organization. Procedures, the fifth component, are very specific to the information needed to answer a specific question.

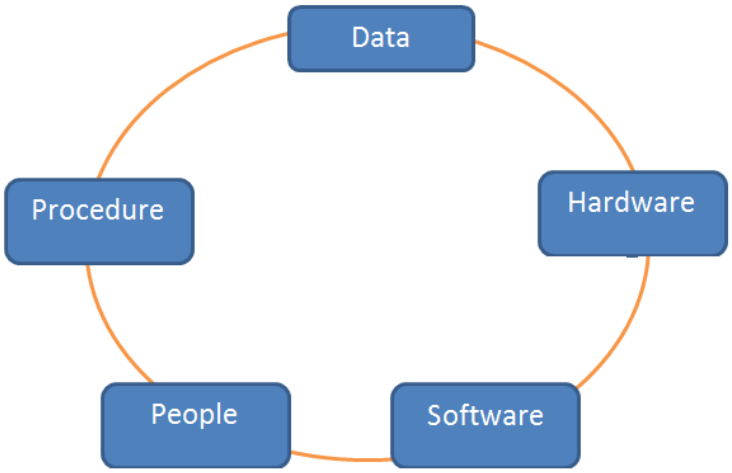


Fig:1.2:- Components of Information Systems

1.3 What is 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. A system

(sometimes called a dynamic system) has three basic interacting components or functions. These include:

• **Input** involves capturing and assembling elements that enter the system to be processed.

• **Processing** involves transformation processes that convert input into output.

• **Output** involves transferring elements that have been produced by a transformation process to their ultimate destination.

Two additional components of the system concept include feedback and control. A system with feedback and control components is sometimes called a cybernetic system, that is, a self-monitoring, self-regulating system.

• **Feedback** is data about the performance of a system.

• **Control** involves monitoring and evaluating feedback to determine whether a system is moving toward the achievement of its goals. The control function then makes necessary adjustments to a system's input and processing components to ensure that it produces proper output.

1.4 Functional Areas of Information Systems in Business:

- Accounting
- Finance
- Marketing
- Human resources
- Manufacturing
- Retail
- Customer services

1.5 Information System in Business

The information in organization is very useful as it directly links to how it helps decision makers realize the organization's goals. Computers and information systems assist organizations to improve the business operations. If management has good knowledge of the potential impact of information systems and having the ability to put this knowledge to work, it can result in a successful personal career and in organizations that reach their goals. System users, business managers, and information systems professionals must work together to develop a successful

information system. Information systems must be applied considerately and carefully so that society, businesses, and industries can gain benefits.

Information systems have been developed to fulfill the requirement of various organizations and people. The speed and pervasive use of information systems, creates numerous threats from immoral people, Computer criminals and terrorists (Conlin, 2009). Although information systems can provide huge benefits, they have many drawbacks. Some drawbacks are minor, such as receiving unwanted e-mail (Staff, 2009). Barriers to Information systems:

1. Privacy of customers
2. Privacy of employees
3. Social imbalance
4. Language challenge
5. Time and distance challenges

Other problems using information system can be severe, where people's personal data, including Social Security and credit card numbers, can be lost or stolen that results in credit card fraud and ruined credit. In the United States, reports of the Privacy Rights Clearinghouse estimates that since early 2015, about 150 million computer records have been stolen or exposed to fraud. This type of data loss can cost companies hundreds of dollars per lost record. Some companies have spent huge money to examine and counteract stolen computer records. Computer-related errors and waste are also a major issue in information system.

There are many global challenges in information systems. Changes in society due to increased international trade and cultural exchange, known as globalization, have a significant impact on organizations and their information system.

To summarize, Information systems is vital part of contemporary organizations and businesses and are designed to support management activities and making wise decision for the success and gaining competitive advantage. It is described by management theorists as an information system that can be any organized combination of people, hardware, software, communications network, and data resources that collects, transforms, and disseminates information in an organization. It can be established that the information system has imperative role in the organization by satisfying the various needs through a variety of systems such as Query systems, Analysis systems, Modeling systems and Decision support systems. Although, effective use of information systems in management decision making enable managers to perform successfully

and help organization succeed, but there is not equate management empirical studies and results that scrutinize the role of information systems technology in decision making.

1.6 Solving Business Problems with Information Systems

A Systems Approach to Problem Solving describes and gives examples of the steps involved in using a systems approach to solve business problems.

A. The Scientific Method vs. the Systems Approach

1. The Scientific Method

The systems approach is based on the established problem-solving methodology known as the scientific method. The scientific method consists of five steps:

1. Recognize phenomena in the real world.
2. Formulate a hypothesis about the causes or effects of the phenomena.
3. Test the hypothesis through experimentation.
4. Evaluate the results of the experiments.
5. Draw conclusions about the hypothesis.

2. The Systems Approach

The systems approach is a modification of the scientific method. It stresses a systematic process of problem solving. Problems and opportunities are viewed in a systems context. Studying a problem and formulating a solution becomes an organized system of interrelated activities.

1. Define a problem or opportunity in a systems context.
2. Gather data describing the problem or opportunity
3. Identify alternative solutions.
4. Evaluate each alternative solution.
5. Select the best solution.
6. Implement the selected solution.
7. Evaluate the success of the implemented solution.

It is important to realize that the steps of the systems approach may overlap each other. Some activities can be used in more than one step of the process. The completion of activities in one step may extend into the performance of another. Sometimes it may be necessary to cycle back to a previously completed step for another try.

The activities and steps of the systems approach are typically grouped into a smaller number of stages of problem solving:

a. Understanding a problem or opportunity (steps 1 and 2).

b. Developing a solution (steps 3 through 5).

c. Implementing a solution (steps 6 and 7).

B. Understanding a Problem or Opportunity

To solve a problem or pursue an opportunity requires a thorough understanding of the situation at hand. This implies viewing the problem/opportunity in a systematic fashion within a systems context.

1. **Defining Problems and Opportunities**. Problems and opportunities must be identified when using the systems approach. Symptoms must be separated from problems. Symptoms are merely signals of underlying problems.

a. A problem is a basic condition that causes undesirable results.

b. An opportunity is a condition that presents the potential for desirable results.

2. **Gathering Data and Information.** Data and information need to be captured to gain sufficient background into the problem or opportunity situation. In the context of a business systems problem, information gathering may encompass the following:

a. Interviews with employees, customers, and managers.

b. Questionnaires to appropriate end users in the organization.

c. Personal observation or involvement in business operations.

d. Examination of documents, reports, procedures manuals, and other documentation.

e. Inspecting accounting and management reports to collect operating statistics, cost data, and performance results.

f. Development, manipulation, and observation of a model of the business operations or systems affected by the problem or opportunity.

1.7 Identifying Organizational Systems.

In the systems approach, a problem or opportunity must be viewed in a systems context. To understand a problem or opportunity, you must understand both the organizational systems and environmental systems in which a problem or opportunity arises. You must have a systemic view of the situation.

a. **A Business as a System.** A business faced with a problem or opportunity needs to be viewed as an organizational system operating within a business environment (Figure 2). This concept helps us isolate and better understand how a problem or opportunity may be related to the basic system components of a business.

b. **Environmental Systems.** A business is a subsystem of society and is surrounded by other systems in the business environment. Proper interrelationships with the economic, political, and social stakeholders within the environment should be maintained. These stakeholders that interact with a business need to be identified, to determine their effect on a problem or solution.

c. **Organizational Subsystems.** Typically a business is subdivided into subdivisions that compose the organizational subsystem.

i. These typically represent functional areas such as marketing, manufacturing, and finance, but can also represent geographic areas, product lines, distribution facilities, work groups, etc.

ii. Decomposition is the process of identifying the boundaries of subsystems within a business and determining the relationships between the subsystems. Those subsystems most affected by the problem or opportunity under consideration need to be identified.

(1). Boundaries - for responsibility.

(2). Relationships - between subsystems.

d. **Relationships between Systems.** A black box approach aids systems professionals in analyzing the relationships and interconnections between subsystems within the firm. In other words, the processing component remains a black box while inputs and outputs of subsystems are studied.

i. **Coupling** - the process of determining how tight the function of subsystems are connected. e.g., JIT - requires a close association between inventory control and manufacturing.

ii. **Decoupling** - the process of loosening the connections between systems. e.g., E-Mail may loosen communications connections within the organization. People can be more efficient by having differing avenues of communication available to them.

e. **Evaluating Selected Systems.** To understand a problem and solve it, you should try to determine if basic system functions are being properly performed. This should be done within a systems context by looking at inputs, processing, outputs, feedback, and control structures.

i. Inputs.

ii. Processing capabilities.

iii. Outputs.

iv. Feedback.

v. Control structures.

f. Determining Objectives, Standards, and Constraints - a systems approach must determine firm objectives, identify standards, and recognize constraints. Figure 4 demonstrates the general systems model of the firm with its interrelated components.

i. **Objectives** - are accomplishments a system is supposed to achieve. These need to be stated in clear unambiguous (general) terms. e.g., a good performance for this season.

ii. **Standards** - are specific and quantitative measures with which the objectives achievements can be compared. Standards are used to measure the progress a firm makes as it tries to achieve objectives of the system. Standards are needed for systems control.

iii. **Constraints** - are restrictions on the form and content of a solution

(1). External - constraints required by law or industry conventions.

(2). Internal - constraints that arise due to the scarcity and allocation of organizational resources or contention among departments.

C. Developing a Solution

Once you understand a problem or opportunity, you can develop an appropriate solution.

3. Designing Alternative Solutions. Jumping immediately from problem definition to a single solution limits your options and robs you of the chance to consider the advantages and disadvantages of several alternatives. Of course, having too many alternatives can obscure the best solution. Alternative solutions may come from past experience, advice of others, simulation of business operations models, and your own intuition and ingenuity. The "doing nothing" option is also a valid alternative.

4. Evaluating Alternative Solutions. To identify the best solution, the proposed alternatives need to be evaluated. The goal of evaluation is to determine how well each alternative solution helps the firm and its selected subsystems meet their objectives.

a. **Evaluation criteria** - should reflect the firm's objectives and constraints. Figure 5 illustrates a simple example of the evaluation of two alternative solutions using several criteria.

i. Each alternative needs to be evaluated upon how well it meets the evaluation criteria.

ii. Criteria may be weighted on their relative importance in achieving firm goals and objectives.

b. **Cost Benefit Analysis** - Every legitimate solution will have some advantages or benefits, and some disadvantages or costs. This process identifies the benefits and costs associated with each alternative solution.

i. **Tangible costs** - quantified costs.

(1). Hardware.

(2). Software.

(3). Salaries.

ii. **Intangible Costs** - difficult to quantify.

(1). Customer goodwill.

(2). Employee morale caused by system errors.

(3). Installation/conversion problems.

iii. **Tangible Benefits -** favorable results that the firm has attained.

(1). Decrease in payroll.

(2). Decrease in inventory carry.

iv. **Intangible Benefits** - hard to estimate.

(1). Customer service.

(2). Better delivery of customer request(s).

5. **Selecting the Best Solution.** Once all alternative solutions have been evaluated, they can be compared to each other, and the "best" (most desirable) solution can be selected. Since the solutions are compared based on multiple criteria (some of which may be intangible), this selection is not always a simple process.

D. Implementing a Solution

6. **Implement the selected solution.** Once a solution has been selected, it must be implemented. An implementation plan may have to be developed. A project management effort may be required to supervise the implementation of large projects. Typically, an implementation plan specifies the activities, resources, and timing needed for proper implementation. This may include:

a. Types and sources of hardware and software.

b. Construction of physical facilities.

c. Hiring and training of personnel.

d. Start-up and operating procedures.

e. Conversion procedures and timetables.

7. **Post implementation Review (Evaluate the success of the implemented solution).** The focus of the post implementation review is to determine if the implemented solution has indeed helped the firm and selected subsystems meet their system objectives. If not, the systems approach assumes you will cycle back to a previous step and make another attempt to find a workable solution.

E. Applying the Systems Approach to Information Systems.

A variety of information systems development methodologies tailor the systems approach to the process of developing information systems solutions to business problems. A firm may experience difficulties in applying the systems process to IS due to:

1. Departmental/unit and/or emotional conflicts.
2. Rapidly changing environmental conditions.

1.8 Types of Information Systems.

A business has several information systems:

(A) Formal Information System

(B) Informal Information System

(C) Computer Based Information System

(a) **Formal Information System**: It is based on organizational chart represented by the organization.

(b) **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.

(c) **Computer Based Information System (CBIS)**: This category of information system depends mainly on the computer for handling business application. System analysis develops different types of information system to meet variety of business needs. There is class of system known as collectively as computer based information system. They are categorized in the following 6 classes:

1. Transaction Processing System (TPS)

2. Management Information System (MIS)

3. Decision Support System (DSS)

4. Executive Support System (ESS)

5. Office Automation Systems (OASs), and

6. Business Expert Systems (BESs)

1. Transaction Processing System:

TPS processes transaction and produces reports. It represents the automation of the fundamental, routine processing used to support business operations. It does not provide any information to the user to his/her decision-making. Previously, TPS was known as Management Information

System. Prior to computers, data processing was performed manually or with simple machines. The domain of TPS is at the lowest level of the management hierarchy of an organization.

2. Management Information System (MIS)

MIS is an information system, which processes data and converts it into information. A management information system uses TPS for its data inputs. The information generated by the information system may be used for control of operations, strategic and long-range planning. Short-range planning, management control and other managerial problem solving. It encompasses processing in support of a wide range of organizational functions & management processes. MIS is capable of providing analysis, planning & decision making support. The functional areas of a business may be marketing, production, human resource, finance and accounting.

3. Decision Support System (DSS)

A decision support system (DSS) is an information system application that assists decision-making. DSS tends to be used in planning, analyzing alternatives, and trial and error search for solution. The elements of the decision support system include a database, model base & software. The main application areas of DSS are Production, finance and marketing.

DSS can be differentiated from MIS on the basis of processing the information. MIS processes data to convert it into information. DSS processes information to support the decision making process of a manager.

4. Executive Support System (ESS)

Executive Support System (ESS) is an extension of the management information system, which is a special kind of DSS; An ESS is specially tailored for the use of chief executive of an organization to support his decision-making. It includes various types of decision-making but it is more specific and person oriented.

5. Office Automation Systems (OAS)

Office automation refers to the application of computes and communication technology to office functions. Office automation systems are meant to improve the productivity of managers at various levels of management of providing secretarial assistance and better communication facilities.

Office activities may be grouped under two classes, namely

i) Activities performed by clerical personnel (clerks, secretaries, typist, etc.,) and

ii) Activities performed by the executives (managers, engineers or other professionals like economist, researches etc.)

In the first category, the following is a list of activities.

a) Typing

b) Mailing

c) Scheduling of meetings and conferences,

d) Calendar keeping, and

e) Retrieving documents

The following is a list of activities in the second category (managerial category)

a) Conferencing.

b) Production of information (messages, memos, reports, etc.) and controlling performance.

6. Business Expert Systems: These systems are one of the main types of knowledge-based information systems. These systems are based on artificial intelligence, and are advanced information systems. A business expert system is a knowledge based information system that uses its knowledge about a specific, complex application area to act as an expert. The main components of an expert system are:

a. Knowledge Base

b. Interface Engine

c. User Interface

Descriptive Type Questions

1. Define Information System. What are the main dimensions of Information System?
2. What are the strategic business objectives of Information system?
3. Explain the behavioral and economic impact of information system on organization.
4. Discuss various information systems serve at various level of organization.
5. Define Information. Elaborate on the characteristics of quality information.
6. What is System? Explain its components.
7. Describe the Relationship between TPS, MIS, DSS, and ESS.
8. List and explain four reasons why information systems are so important for business today.
9. Explain the System View of Business and what is the role of IS in Business?
10. Explain MIS with its Organizational Structure in detail.

Chapter-2

An Overview of Management Information System

2. An Overview of Management Information System:

Management Information System (MIS) is a combination of principles, theories and practices of management, which play an important role in business organization in the planning and decision-making process. It provides information for the personnel at various levels of management for performing their respective jobs. The management information system can be compared with information technology (IT). IT can be considered as a sub-system of MIS.

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 in formally organized groups. The basic functions performed by a manager in an organization are: Planning, controlling, staffing, organizing, and directing.

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

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

2.1 Definition of MIS

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

Information and Decision System, the Computer- based information System. The MIS has more than one definition, some of which are give below.

1. The MIS is defined as a system which provides information support for decision making in the organization.

2. The MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision making function in the organization.

3. The MIS is defined as a system based on the database of the organization evolved for the purpose of providing information to the people in the organization.

4. The MIS is defined as a Computer based Information System.

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

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

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

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

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

MIS is defined as a system that consists of people, machines, procedures, data models and databases as the elements of the system. The system executes the followings:

- Collection of data from internal and external sources of company
- Processing of data
- Proper flow of processed data or management of information to the managers to assist them in the procedure of decision-making

2.2 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.

2.3 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

2.4 Significance of MIS

MIS is defined as the field of management where timely and reliable information plays a very important role. This information is obtained through a logical and well-structured method of collecting information and processing of the collected information, which helps the decision-makers in carrying out the decisions. MIS is very significant these days because the term information is considered equally important to the three M have related to the business industry namely money, materials, men and machines.

The significance of a planned, analyzed, designed and maintained MIS is as follows:

- ✓ Helps in progress and growth of the business and management infrastructure in increasing business complexities by providing timely, useful and reliable information. This information is provided to the management for taking quick, rational and speedy decisions.
- ✓ Helps in globalization and liberalization of the organizations that need to compete not only locally but globally too.

MIS assists decision-makers in organizations by providing Management Information (MI) at various stages of decision-making. Whereas MIS if in case is not maintained properly may provide inaccurate or irrelevant information that may prove costly to the organization.

2.5 Nature and Scope of MIS

MIS is supposed to have borrowed the management concepts from various disciplines such as accounting, computing, organizations, management and operations, because of this interdisciplinary nature of MIS, it is considered both as an art and a science.

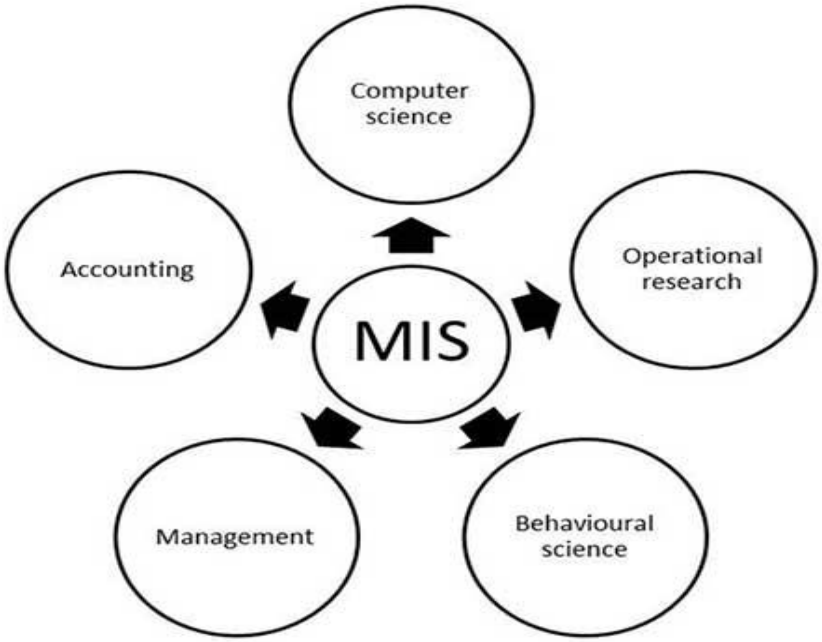


Fig: 2.5:-MIS Diagram

The scope and purpose of MIS is better understood if each part of the term is defined thus:

1. Management – Management is the process of directing, organizing, planning and controlling resources to achieve organizational goal.

a. **Planning** – Planning is a process of establishing organizational goal and to develop strategies to achieve goal.

b. **Organizing** – It is a process to develop the structure of the organization and determine what tasks are to be done, who reports to whom and where decisions are to be made.

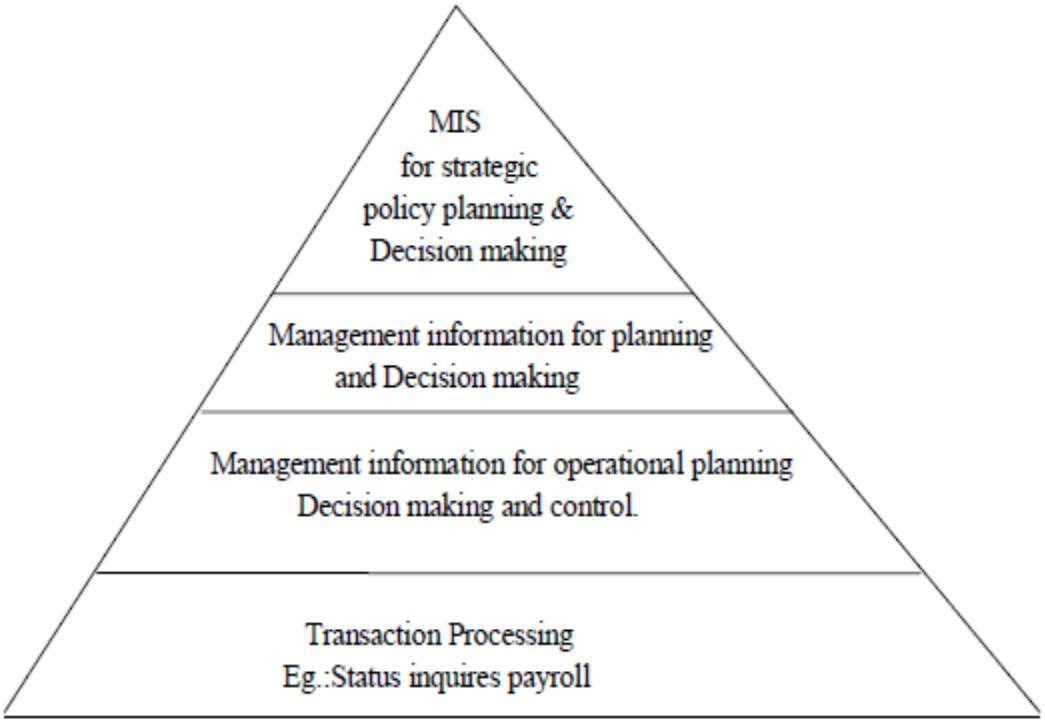
c. **Leading** – It is an important process of motivating and managing employees, directing others and forming task group.

d. **Controlling** – It is the process of evaluating performance of employee. It is a way of monitoring activities to ensure that they are working as per plan.

2. Information – Information is a collection of data in a meaningful way. It is used for informative or interference purpose, argument or basis for forecasting or decision making.

3. System – A system is set of element journal together for a common objective. All system is part of longer system. Different part of a system (division, department functions unit, etc.).

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



MIS and planning Decision making and control

Fig: 2.5.1:-MIS System

2.6 MIS versus Data Processing

1. The data processing functions are data collection, manipulation, and storage as used to report and analyze business activities. The data processing system is oriented primarily to processing transactions for day-to-day operations.

The transactions include sales orders, shipping orders, inventory orders, and payroll data. For most of these transactions, routine procedures can be established and carried out repetitively to do the processing required. The procedures become part of the data processing system.

2. An MIS that functions properly processes and analyses data to provide, in particular planning and control information that supports the decision making role of management. A management information system (MIS) performs substantial functions beyond those of a data processing system.

The MIS involves a man/machine system that provides information for managers to use as they perform their managerial functions of planning, organizing, staffing, directing, and controlling. Such a system supports basic transaction processing as does a data processing system. It also provides information about the past, present, and future (forecasts) as each relates to the operations within the organization and within its environment.

A data processing system is not an MIS. Two major distinctions between these types of systems are:

(1) The characteristics of the information they require, and

(2) The decisions that are made based on this information. Fig. summarizes these differences.

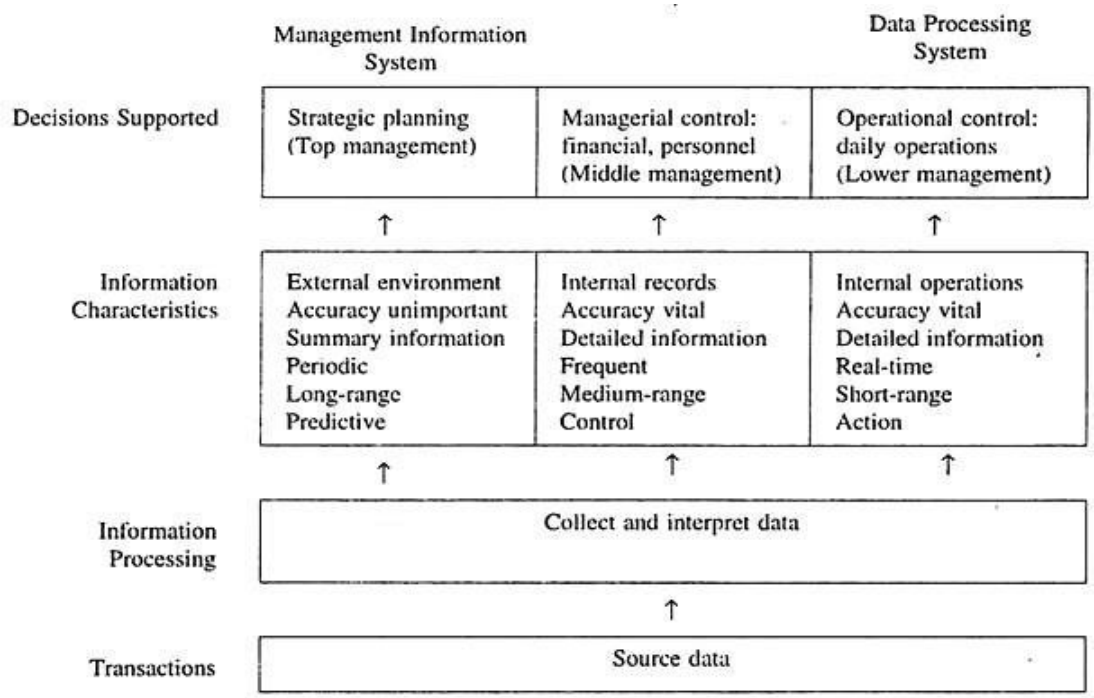


Fig: 2.6:-MIS & Data Processing

2.7 MIS & Decision Support Systems

Managers at all levels require information to be provided to them with speed, brevity, precision and economy to enable them to carry out their functions effectively. This need is satisfied by means of a management information system.

A Management Information System (MIS) is a system that gathers comprehensive data, organizes and summarizes it in a form that is of value to functional managers, and provides them with information they need to carry out their work.

MIS is used to transform data into useful information in order to support managerial decision-making with structured decisions or programmed decisions. In simple words, a MIS is a computer-based information system which assists managers in decision-making and control and in planning more effectively.

The typical MIS is made up of four major components – data gathering, data entry, data transformation and information utilization. The modern MIS is based on a centralized database of raw data. Data is stored in the database in such a way that parts of it may be selected, altered, used in calculations, and transformed into useful information that can be used in a wide variety of applications.

MIS offers a wide spectrum of services at all levels and for all functional areas of the organization. It provides the top management with information pertaining to the external environment. To the middle management, it provides information useful for operational plans and to the first-level managers; it provides internal information useful for operations control.

A decision support system (DSS) is an interactive computer system that can be easily accessed and operated by people who are not computer specialists. It helps them to plan and make decisions. In other words, DSS is a computer-based information system that supports the process of managerial decision-making in situations that are not well structured.

Such systems do not actually provide "answers" or point to optimal decisions for managers. Rather, they attempt to improve the decision--making process by providing tools that help managers analyze the situations more clearly.

Thus DSS does not replace managerial decision-making but supports it and makes the process more effective. DSS has become increasingly popular because of advances in computer software and hardware.

A typical DSS consists of the following elements:

i. An MIS that supports several methodologies for accessing and summarizing data

ii. A sophisticated database that allows information to be accessed in various ways

iii. A user-friendly interface that allows the user to use simple commands rather than technical computer terms when communicating with the DSS

iv. A database built from both external and internal sources so that the manager can relate internal events to external forces

v. Rapid response time, which makes DSS an easy and rewarding system to use.

A DSS must provide information to managers whenever it is needed in a form they can easily understand. A typical DSS places the information under the manager's direct control.

2.8 MIS & Information Resources Management

Information Resources Management (IRM) is the process of managing information resources to accomplish agency missions and to improve agency performance, including the reduction of information collection burdens on the public. When standardized and controlled, these resources can be shared and re-used throughout an agency, not just by a single user or application.

There are three (3) classes of information resources:

- **Business Resources**: Enterprises, Business Functions, Positions (Jobs), Human/Machine Resources, Skills, Business Objectives, Projects, and Information Requirements.
- **System Resources:** Systems, Sub-Systems (business processes), Administrative Procedures (manual procedures and office automation related), Computer Procedures, Programs, Operational Steps, Modules, and Subroutines.
- **Data Resources:** Data Elements, Storage Records, Files (computer and manual), Views, Objects, Inputs, Outputs, Panels, Maps, Call Parameters, and Data Bases.

The concept of RM is actually no different in intent than Materials Resource Planning (MRP) as used in manufacturing. Both are concerned with the efficient and cost effective use of resources. The classification and control of resources are the main objectives. Resources are classified to prove their uniqueness so that redundancy is not introduced and to promote sharing. Control is required to collect, inventory and retrieve resources as required by the business.

Whereas MRP is concerned with managing products and the parts required producing them, IRM is concerned with managing information and the resources required to produce it.

One of the important by-products of cataloging and cross-referencing information resources is a model of the enterprise, including how it is organized and how it operates. Other benefits include:

- All information resources are controllable, permitting the ability to design integrated systems and perform an "impact analysis" of a proposed resource change.
- Simplified search of information resources for reuse. Redundancy of resource definition is eliminated.

- Complete and current documentation of all information resources, in an organized and meaningful way.
- Communications within the organization is improved since developers and users would use standard and common definitions for information resources, all of which would be in standard business terminology.

2.9 Concept of MIS

The MIS is an idea which is associated with man, machine, marketing and methods for collecting information's from the internal and external source and processing this information for the purpose of facilitating the process of decision-making of the business.

MIS is not new, only the computerization is new , before computers MIS techniques existed to supply managers with the information that would permit them to plan and control business operations. The computer has added on more dimensions such as speed, accuracy and increased volume of data that permit the consideration of more alternatives in decision-making process.

Management information system is an integrated set of component or entities that interact to achieve a particular function, objective or goal. Therefore it is a computer based system that provides information for decisions making on planning, organizing and controlling the operation of the sub-system of the firm and provides a synergistic organization in the process.

The component of an information system includes: a hardware which is used for input/output process and storage of data, software used to process data and also to instruct the hand-ware component, data bases which is the location in the system where all the organization data will be automated and procedures which is a set of documents that explain the structure of that management information system.

There are various driving factors of management information system for example:-

Technological revolutions in all sectors make modern managers to need to have access to large amount of selective information for the complex tasks and decisions.

The lifespan of most product has continued getting shorter and shorter and therefore the challenge to the manager is to design product that will take a longer shelf life and in order to do this, the manager must be able to keep abreast of the factors that influences the organization product and services thus, management information system come in handy in supporting the process.

There are huge amount of information available to today's manager and this had therefore meant that managers are increasingly relying on management information system to access the exploding information. Management information services helps manager to access relevant, accurate, up-to-date information which is the more sure way of making accurate decisions. It also helps in automation and incorporation of research and management science techniques into the overall management information system for example probability theory.

The management information services are capable of taking advantage of the computational ability of the company like processing, storage capacity among others.

Based on this relevancy, management information system should be installed and upgraded in various organizations since today's managers need them to access information for managerial decision making and also management functions.

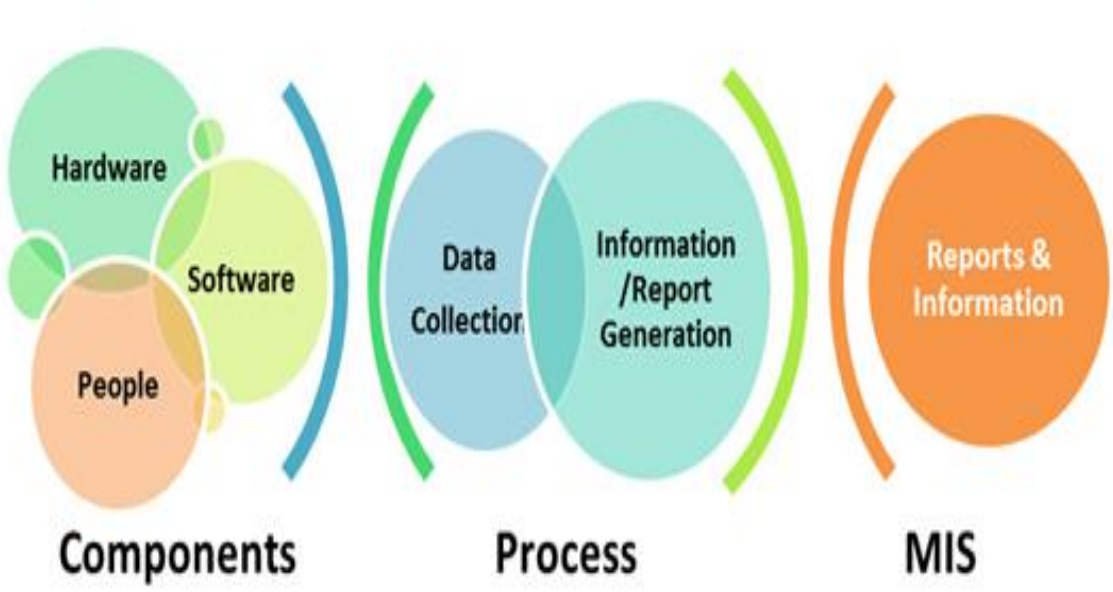


Fig: 2.9:- MIS Process

2.10 Structure of Management Information System

A management information system (MIS) is an organized combination of people, hardware, communication networks and data sources that collects, transforms and distributes information in an organization. An MIS helps decision making by providing timely, relevant and accurate

information to managers. The physical components of an MIS include hardware, software, database, personnel and procedures.

Hardware

All physical components of a computer system compose the computer hardware. Important components include the central processing unit, input/output devices, storage units and communication devices. Communication can be over fiber-optic cables or wireless networks.

Software

Software provides the interface between users and the information system. Software can be divided into two generic types: system software and applications. The system software comprises of the operating system, utility programs and special purpose programs. Applications are developed to accomplish a specific task. For users of MIS it is much more important to understand the software than the hardware. Software maintenance can take 50 to 70 percent of all personnel activity in the MIS function. When the organization moves to implement an advanced information system the hardware and software environment becomes more complex.

Database

A database is a centrally controlled collection of organized data. Central control reduces redundancy and duplication of data. Data is stored in an organized and structured way to facilitate sharing and improve availability to those who need it. The database improves efficiency of storage by elimination of redundant files and improves efficiency of processing by providing all required data in a single file rather than separate files. This also improves efficiency of information retrieval.

Procedures

Three types of procedures are required for an MIS to operate effectively: user instructions, instructions for input preparation and operating instructions for MIS personnel who maintain the MIS.

Personnel

The personnel in the MIS function include computer operators, programmers, systems analysts and managers. Human resource requirements should be assessed by considering both the present

system needs and the future system growth. The quality of MIS personnel is a key factor in its effectiveness. An MIS manager needs a combination of both managerial and technical skills.

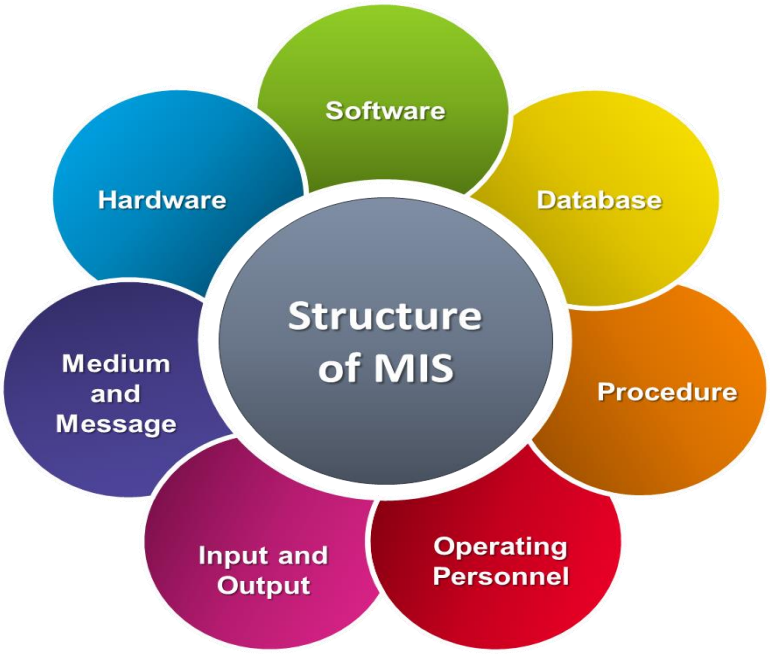


Fig: 2.10:-Structure of Management Information System

The structure of management information system can also be described in terms of the organizational functions. Though there is no standard classification of functions, a typical set of functions in a manufacturing organization includes production, sales and marketing, finance and accounting, materials, personnel and information systems.

Activities:

1. Strategic planning
2. Management control
3. Operational control
4. Transaction processing

Organizational Function:

1. Production
2. Finance
3. Personnel
4. MIS etc.

Descriptive Type Questions

1. What the Challenges Management Information System faces at each level.
2. What are the Characteristics of MIS? And what are the purposes and uses of it?
3. Differentiate between MIS & Data Processing.
4. What are the Development Stages of MIS within Organization? Discuss merits and demerits of developing MIS in the organization.
5. What are the components and resources of MIS?
6. How can we provide controlling to MIS?
7. What do you mean by manual information system? Explain with example.
8. What is the difference between Manual and Computer based Information System.
9. Define DSS. What are its uses?
10. Explain System Approach of MIS in Planning, Organizing and Controlling.

Chapter-3

Concept of Organizational Planning

3. Concept of Organizational Planning

Organizational planning refers to the process of identifying organization's objectives and formulating and monitoring specific strategies to achieve them. It also entails staffing and resource allocation and is one of the important responsibilities of a management team.

Organizational structures need to be formulated and implemented with a view to achieve organizational goals in an efficient manner. Thus, having a suitable organizational structure in place is a prerequisite for long term success.

3.1 Concept of Planning & Control:

Planning is the process by which an individual or organization decides in advance on some future course of action. Planning and controlling are two separate functions of management, yet they are closely related. The scope of activities if both is overlapping to each other. Without the basis of planning, controlling activities becomes baseless and without controlling, planning becomes a meaningless exercise. In absence of controlling, no purpose can be served by. Therefore, planning and controlling reinforce each other. According to Billy Goetz, "Relationship between the two can be summarized in the following points

- Planning precedes controlling and controlling succeeds planning.
- Planning and controlling are inseparable functions of management.
- Activities are put on rails by planning and they are kept at right place through controlling.
- The process of planning and controlling works on Systems Approach which is as follows

  Planning → Results → Corrective Action

- Planning and controlling are integral parts of an organization as both are important for smooth running of an enterprise.
- Planning and controlling reinforce each other. Each drives the other function of management.

In the present dynamic environment which affects the organization, the strong relationship between the two is very critical and important. In the present day environment, it is quite likely that planning fails due to some unforeseen events. There controlling comes to the rescue. Once controlling is done effectively, it gives us stimulus to make better plans. Therefore, planning and controlling are intemperate functions of a business enterprise.

3.2 The Planning Process

Planning is the first primary function of management that precedes all other functions. The planning function involves the decision of what to do and how it is to be done? So managers focus a lot of their attention on planning and the planning process. Let us take a look at the eight important steps of the planning process.

The planning function of management is one of the most crucial ones. It involves setting the goals of the company and then managing the resources to achieve such goals. As you can imagine it is a systematic process involving eight well thought out steps. Let us take a look at the planning process.

Fig: 3.2:-Planning Process

1. **Recognizing Need for Action**

An important part of the planning process is to be aware of the business opportunities in the firm's external environment as well as within the firm. Once such opportunities get recognized the managers can recognize the actions that need to be taken to realize them. A realistic look must be taken at the prospect of these new opportunities.

2. **Setting Objectives**

This is the second and perhaps the most important step of the planning process. Here we establish the objectives for the whole organization and also individual departments.

Organizational objectives provide a general direction; objectives of departments will be more planned and detailed.

Objectives can be long term and short term as well. They indicate the end result the company wishes to achieve. So objectives will percolate down from the managers and will also guide and push the employees in the correct direction.

3. Developing Premises

Planning is always done keeping the future in mind, however, the future is always uncertain. So in the function of management certain assumptions will have to be made. These assumptions are the premises. Such assumptions are made in form of forecasts, existing plans, past policies etc.

These planning premises are also of two types – internal and external. External assumptions deal with factors such as political environment, social environment, advancement of technology, competition, government policies etc. Internal assumptions deal with policies, availability of resources, quality of management etc.

These assumptions being made should be uniform across the organization. All managers should be aware of these premises and should agree with them.

4. Identifying Alternatives

The fourth step of the planning process is to identify the alternatives available to the managers. There is no one way to achieve the objectives of the firm, there is a multitude of choices. All of these alternative courses should be identified. There must be options available to the manager.

Maybe he chooses an innovative alternative hoping for more efficient results. If he does not want to experiment he will stick to the more routine course of action. The problem with this step is not finding the alternatives but narrowing them down to a reasonable amount of choices so all of them can be thoroughly evaluated.

5. Examining Alternate Course of Action

The next step of the planning process is to evaluate and closely examine each of the alternative plans. Every option will go through an examination where all there pros and cons will be weighed. The alternative plans need to be evaluated in the light of the organizational objectives.

For example, if it is a financial plan. Then it that cases its risk-return evaluation will be done. Detailed calculation and analysis are done to ensure that the plan is capable of achieving the objectives in the best and most efficient manner possible.

6. **Selecting the Alternative**

Finally, we reach the decision making stage of the planning process. Now the best and most feasible plan will be chosen to be implemented. The ideal plan is the most profitable one with the least amount of negative consequences and is also adaptable to dynamic situations.

The choice is obviously based on scientific analysis and mathematical equations. But a managers intuition and experience should also play a big part in this decision. Sometimes a few different aspects of different plans are combined to come up with the one ideal plan.

7. **Formulating Supporting Plan**

Once you have chosen the plan to be implemented, managers will have to come up with one or more supporting plans. These secondary plans help with the implementation of the main plan. For example plans to hire more people, train personnel, expand the office etc are supporting plans for the main plan of launching a new product. So all these secondary plans are in fact part of the main plan.

8. **Implementation of the Plan**

And finally, we come to the last step of the planning process, implementation of the plan. This is when all the other functions of management come into play and the plan is put into action to achieve the objectives of the organization. The tools required for such implementation involve the types of plans- procedures, policies, budgets, rules, standards etc.

3.3 Concept of Control:

The term control has different connotations depending upon the context of the use of the term. In manufacturing it refers to a Device or mechanism installed or instituted to guide or regulates the activities or operation of an apparatus, machine, person, or system; in law it refers to controlling interest and in management as an authority to order and manage the workings and management of an entity.

Control is a management process to aim at achieving defined goals within an established timetable, and comprises of three components:

(1) Setting standards,

(2) Measuring actual performance, and

(3) Taking corrective action.

3.4 Characteristics of Control:

Following characteristics of control can be identified:

1. Control is a Managerial Process:

Management process comprises of five functions, viz., planning, organizing, staffing, directing and controlling. Thus, control is part of the process of management.

2. Control is forward looking:

Whatever has happened has happened, and the manager can take corrective action only of the future operations. Past is relevant to suggest what has gone wrong and how to correct the future.

3. Control exists at each level of Organization:

Anyone who is a manager, has to involve into control – may be Chairman, Managing Director, CEO, Departmental head, or first line manager. However, at every level the control will differ – top management would be involved in strategic control, middle management into tactical control and lower level into operational control.

4. Control is a Continuous Process:

Controlling is not the last function of management but it is a continuous process. Control is not a one-time activity, but a continuous process. The process of setting the standards needs constant analysis and revision depending upon external forces, plans, and internal performance.

5. Control is closely linked with Planning:

Planning and controlling are closely linked. The two are rightly called as ‘Siamese twins’ of management. “Every objective, every goal, every policy, every procedure and every budget become standard against which actual performance is compared.

Planning sets the ship’s course and controlling keeps it on course. When the ship begins to veer off the course, the navigator notices it and recommends a new heading designed to return the

ship to its proper course. Once control process is over its findings are integrated into planning to prescribe new standards for control.

6. Purpose of Controlling is Goal Oriented and hence Positive:

Control is there because without it the business may go off the track. The controlling has positive purpose both for the organization (to make things happen) and individuals (to give up a part of their independence for the attainment of organizational goals).

3.5 Process of Control:

Following are the steps involved into the process of control:

1. Establish the Standards:

Within an organization's overall strategic plan, managers define goals for organizational departments in specific, precise, operational terms that include standards of performance to compare with organizational activities. However, for some of the activities the standards cannot be specific and precise.

Standards, against which actual performance will be compared, may be derived from past experience, statistical methods and benchmarking (based upon best industry practices). As far as possible, the standards are developed bilaterally rather than top management deciding unilaterally, keeping in view the organization's goals.

Standards may be tangible (clear, concrete, specific, and generally measurable) – numerical standards, monetary, physical, and time standards; and intangible (relating to human characteristics) – desirable attitudes, high morale, ethics, and cooperation.

2. Measure Actual Performance:

Most organizations prepare formal reports of performance measurements both quantitative and qualitative (where quantification is not possible) that the managers review regularly. These measurements should be related to the standards set in the first step of the control process.

For example, if sales growth is a target, the organization should have a means of gathering and reporting sales data. Data can be collected through personal observation (through management by walking around the place where things are happening), statistical reports (made possible by

computers), oral reporting (through conferencing, one-to-one meeting, or telephone calls), written reporting (comprehensive and concise, accounting information – normally a combination of all. To be of use, the information flow should be regular and timely.

3. Compare Performance with the Standards:

This step compares actual activities to performance standards. When managers read computer reports or walk through their plants, they identify whether actual performance meets, exceeds, or falls short of standards.

Typically, performance reports simplify such comparison by placing the performance standards for the reporting period alongside the actual performance for the same period and by computing the variance—that is, the difference between each actual amount and the associated standard.

The manager must know of the standard permitted variation (both positive and negative). Management by exception is most appropriate and practical to keep insignificant deviations away. Timetable for the comparison depends upon many factors including importance and complexity attached with importance and complexity.

4. Take Corrective Action and Reinforcement of Successes:

When performance deviates from standards, managers must determine what changes, if any, are necessary and how to apply them. In the productivity and quality-centered environment, workers and managers are often empowered to evaluate their own work. After the evaluator determines the cause or causes of deviation, he or she can take the fourth step— corrective action.

The corrective action may be to maintain status quo (reinforcing successes), correcting the deviation, or changing standards. The most effective course may be prescribed by policies or may be best left up to employees' judgment and initiative. The corrective action may be immediate or basic (modifying the standards themselves).

3.6 The Nature of Control in an Organization

All organizations (businesses, universities, governments, hospitals) are concerned with channeling human efforts toward attainment of organizational objectives. Regardless of their formal purposes, organizations are composed of people with their own personal interests. Even if these individuals and groups wish to help attain organizational goals, the organization of which they are a part must coordinate their efforts and direct them toward specific goals. Thus

organizations must influence or control the behavior of people, if they are to fulfill their plans and achieve their goals.

On the basis of designing Control Systems:

Three approaches may be followed while designing control systems, viz., Market Control, Bureaucratic Control, and Clan Control. However, most organizations do not depend only on just one of them.

1. Market Control:

Control is based upon market mechanisms of competitive activities in terms of price and market share. Different divisions are converted into profit centers and their performance is evaluated by segmental top line (turnover), bottom line (profit) and the market share.

Using market control will mean that the managers in future will allocate resources or create departments or other activities in line with the market forces.

2. Bureaucratic Control:

Bureaucratic control focuses on authority, rule and regulations, procedures and policies. Most of the public sector units in India go in for bureaucratic control.

If they do not go by the rulebook, the legislative committees and the ministries under whom they work will reprimand them. In a hospital no medicine can be used unless the prescription is there and it is recorded in the issue register, even if the patient may die in between.

3. Clan Control:

The control systems are designed in a way that give way to shared vision, shared values, norms, traditions and beliefs, etc., part of the organizational culture.

It is not based upon hierarchical mechanisms, but work-related and performance measures. This kind of control is most suitable for the organizations which use team style of work groups and where technology changes very fast.

On the basis of Levels:

People at different level have different planning responsibilities, so do they undertake controlling. On the basis of levels controls, can be categorized as Operational, Structural, Tactical, and Strategic.

1. Operational Control:

Its focus remains upon the processes used by the organization for transforming the inputs (resources) into outputs (products/services). Operational controls are used at the lower management. It is exercised almost every day. Quality control, financial controls are part of operational controls.

2. Structural Control:

Are the different elements of organization structure serving their intended aims? Is there overstaffing? Is the ratio of staff to line increasing? Necessary action is to be undertaken.

Two important forms of structural control can be bureaucratic control and clan control, about which we have already talked. Structural control is exercised by top and middle management.

3. Tactical Control:

Since tactical control deals with the departmental objectives, the controls are largely exercised by middle management levels.

4. Strategic Control:

Strategic controls are early warning systems. Strategic control is the process to determine whether the effectiveness of a corporate, business and functional strategies are successful in helping organizations to meet its goals. Strategic controls are exercised by top level management.

Descriptive Type Questions

1. What do you mean by planning? Explain its types.
2. Explain System Approach of MIS in Planning, Organizing and Controlling.
3. What is Planning Process? Explain.
4. What is control process? Explain the nature of control in any organization.
5. Explain Decision Support System (DSS) with its process and Characteristics.
6. Explain Planning and Implementation process of MIS in detail.
7. Briefly explain the complete process of decision making.
8. Explain the conversion process of manual to computer based systems software.
9. Differentiate between Application Software and system software.
10. Briefly explain the complete process of decision making.

Chapter-4

Business Applications of Information Technology

4. Business Applications of Information Technology

Business software or a business application is any software or set of computer programs used by business users to perform various business functions. These business applications are used to increase productivity, to measure productivity and to perform other business functions accurately.

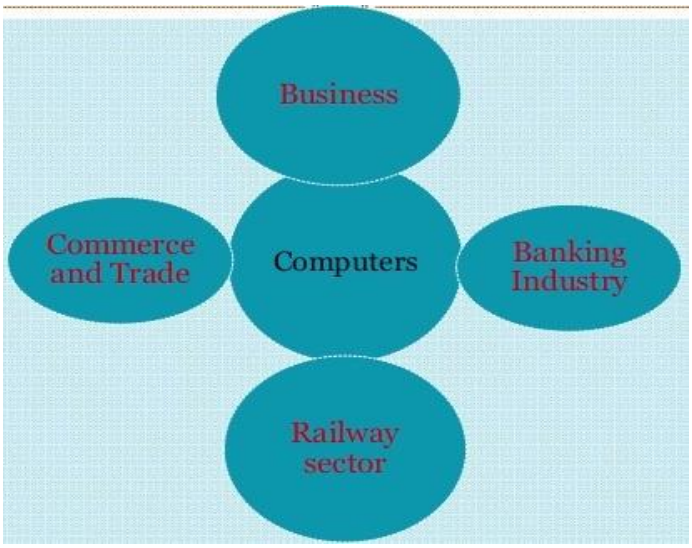


Fig:4:- Business Applications of Information Technology

Today's businesses rely more heavily on technology than ever before. From improved telecommunications to online payment options, most modern businesses could not function as effectively or efficiently without technology. Even the ability to accept credit or debit card payments at retail stores requires a complex system of bank exchanges and telecommunications in order to operate smoothly and reliably. The application of information technology in management provides opportunities to work outside the office and have increased access to important information regardless of location.

4.1 Internet

The internet is a globally connected network system that uses TCP/IP to transmit data via various types of media. The internet is a network of global exchanges – including private, public,

business, academic and government networks – connected by guided, wireless and fiber-optic technologies.

The terms internet and World Wide Web are often used interchangeably, but they are not exactly the same thing; the internet refers to the global communication system, including hardware and infrastructure, while the web is one of the services communicated over the internet.

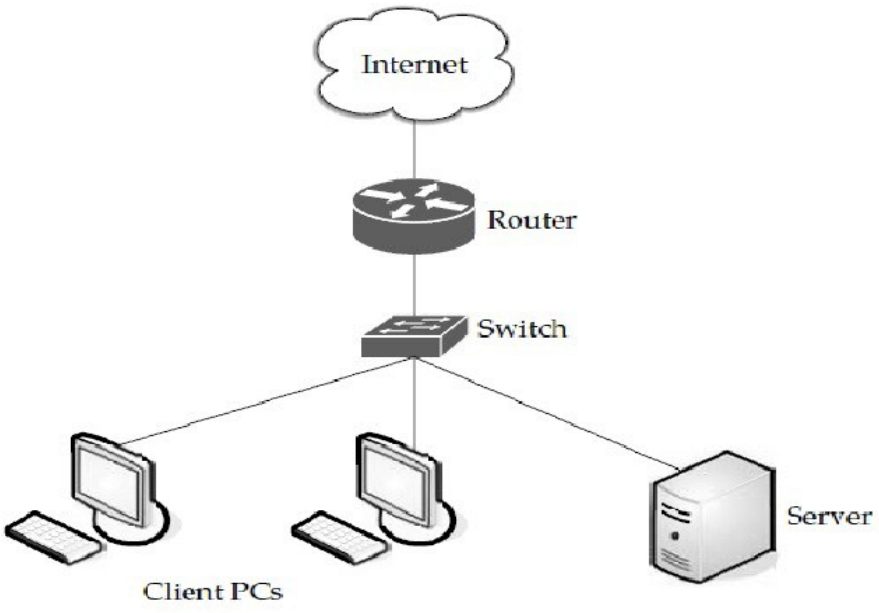


Fig: 4.1:- Internet

As computing advanced, peer-to-peer (P2P) communication was gradually delivered and enhanced. Since the 1990s, the internet has greatly influenced and upgraded networking to global standards. Billions of internet users rely on multiple application and networking technologies, including:

Internet Protocol (IP): The internet's primary component and communications backbone. Because the internet is comprised of hardware and software layers, the IP communication standard is used to address schemes and identify unique connected devices. Prominent IP versions used for communications include Internet Protocol version 4 (IPv4) and Internet Protocol version 6 (IPv6).

Communications: The internet is the most cost-effective communications method in the world, in which the following services are instantly available:

- Email

- Web-enabled audio/video conferencing services
- Online movies and gaming
- Data transfer/file-sharing, often through File Transfer Protocol (FTP)
- Instant messaging
- Internet forums
- Social networking
- Online shopping
- Financial services

The internet originated with the U.S. government, which began building a computer network in the 1960s known as ARPANET. In 1985, the U.S. National Science Foundation (NSF) commissioned the development of a university network backbone called NSFNET. The system was replaced by new networks operated by commercial internet service providers in 1995. The internet was brought to the public on a larger scale at around this time.

4.2 E-Commerce

Electronic commerce or ecommerce is a term for any type of business, or commercial transaction that involves the transfer of information across the Internet. It covers a range of different types of businesses, from consumer based retail sites, through auction or music sites, to business exchanges trading goods and services between corporations. It is currently one of the most important aspects of the Internet to emerge.

“A system for the buying and selling of goods and services using the Internet as the main means of exchange”.

E-commerce allows consumers to electronically exchange goods and services with no barriers of time or distance. Electronic commerce has expanded rapidly over the past five years and is predicted to continue at this rate, or even accelerate. In the near future the boundaries between "conventional" and "electronic" commerce will become increasingly blurred as more and more businesses move sections of their operations onto the Internet.

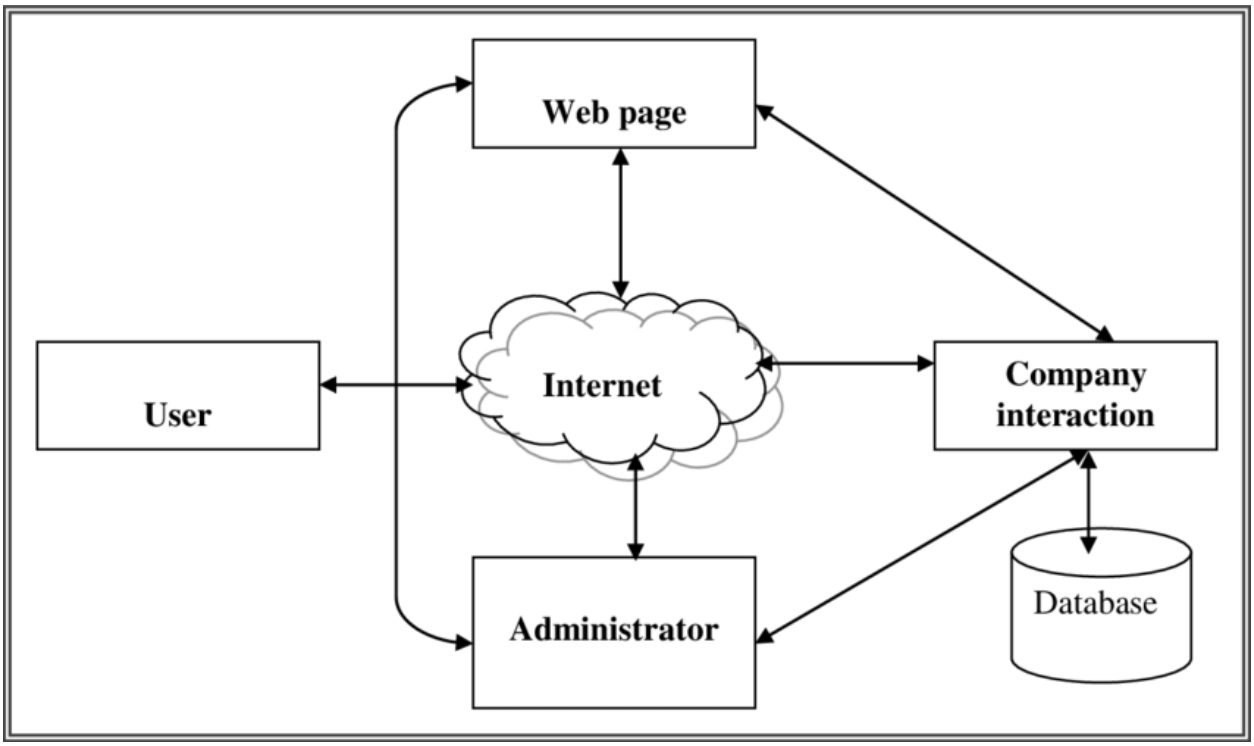


Fig:-4.2: E-Commerce

E-commerce is often confused with e-business, although they have nothing to do with one another. E-commerce only refers to the goods and services transaction between a seller and a consumer, whereas e-business refers to the complete process necessary to manage an online business.

4.3 Intranet

An intranet is a private network, operated by a large company or other organization, which uses internet technologies, but is insulated from the global internet.

Intranet is a computer network system in which a specific organizational systems share information, computing services and operational systems with each other by using an Internet (IP) technology.

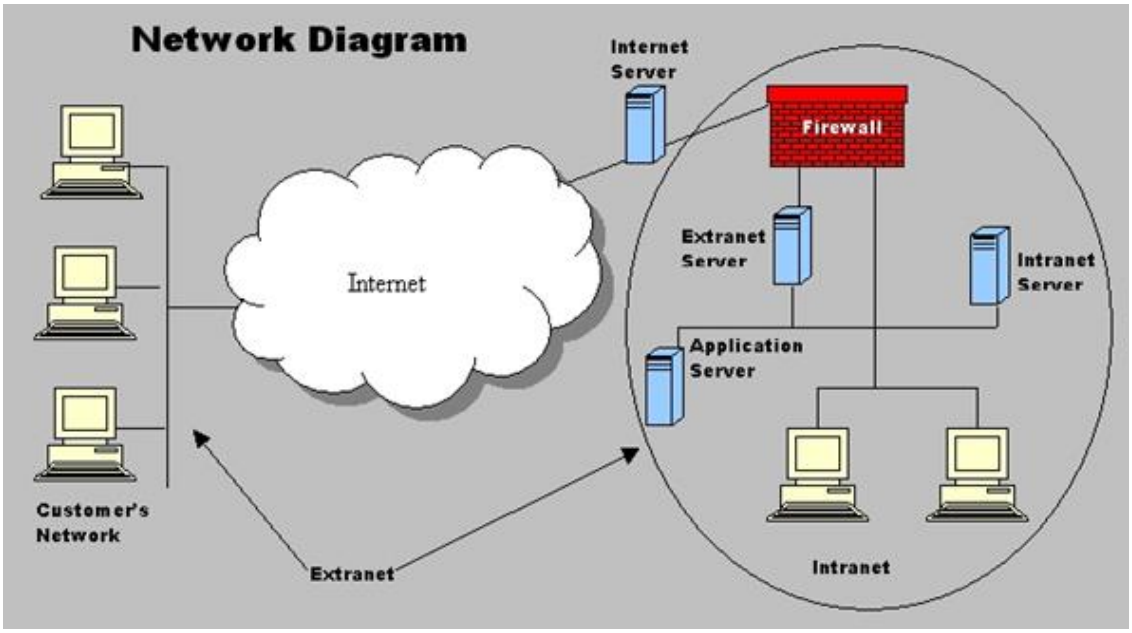


Fig: 4.3:- Intranet

4.4 Extranet

An extranet is an intranet that is accessible to some people from outside the company, or possibly shared by more than one organization.

Extranet is a kind of computer network that allows the outside users to access the Intranet of organization.

This network system is basically used for business to business (B2B) purposes. This system basically allows the outside users of an organization, like partners, suppliers, vendors and other stakeholders to remain in touch with the activities of organization.

Information and data access performed through a proper account or link system. This is a best network system to keep in touch with market position and share a large amount of data to partners in a timely manner.

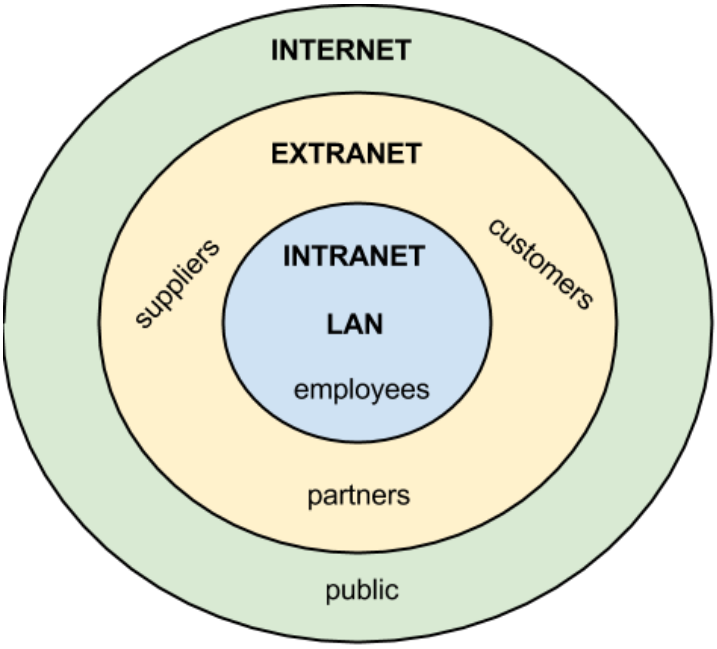


Fig:4.4:-Extranet

4.5 Enterprise Solutions

Enterprise applications are specifically designed for the sole purpose of promoting the needs and objectives of the organizations.

Enterprise applications provide business-oriented tools supporting electronic commerce, enterprise communication and collaboration, and web-enabled business processes both within a networked enterprise and with its customers and business partners.

Services Provided by Enterprise Applications

Some of the services provided by an enterprise application include –

- Online shopping, billing and payment processing
- Interactive product catalogue
- Content management
- Customer relationship management
- Manufacturing and other business processes integration
- IT services management
- Enterprise resource management
- Human resource management

- Business intelligence management
- Business collaboration and security
- Form automation

Most Commonly Used Enterprise Applications

Multitude of applications comes under the definition of Enterprise Applications. In this section, let us briefly cover the following applications −

- Management information system (MIS)
- Enterprise Resource Planning (ERP)
- Customer Relationship Management (CRM)
- Decision Support System (DSS)
- Knowledge Management Systems (KMS)
- Content Management System (CMS)
- Executive Support System (ESS)
- Business Intelligence System (BIS)
- Enterprise Application Integration (EAI)
- Business Continuity Planning (BCP)
- Supply Chain Management (SCM)

4.6 Information System for Managerial Decision Support

Information System for Managerial Decision Making Many Organization are also tapping versatility and power of Computers by designing and developing systems tailored to meet the specific needs. An increasing number of Managers rely on computers and information system to make decision. Managers and different level in an organization make different kind of decision making (operational, tactical and strategic) so that the kind of information necessary to support their decision are also different. Accordingly different types of information systems are designed to meet the various information need of managers. For example, the Genesis project of American Express shows how a special type of information systems helps managers analyze computer transaction.

Decision support systems (DSS) are interactive software-based systems intended to help managers in decision-making by accessing large volumes of information generated from various

related information systems involved in organizational business processes, such as office automation system, transaction processing system.

There are four types of Information System: Transaction Processing System (TPS) Management Information System (MIS) Intelligent Support System (ISS) Decision Support System (DSS) Executive Information System (EIS) Expert System (ES) Office Automation System (OAS) The type of information system used by an organization depends on its information needs.

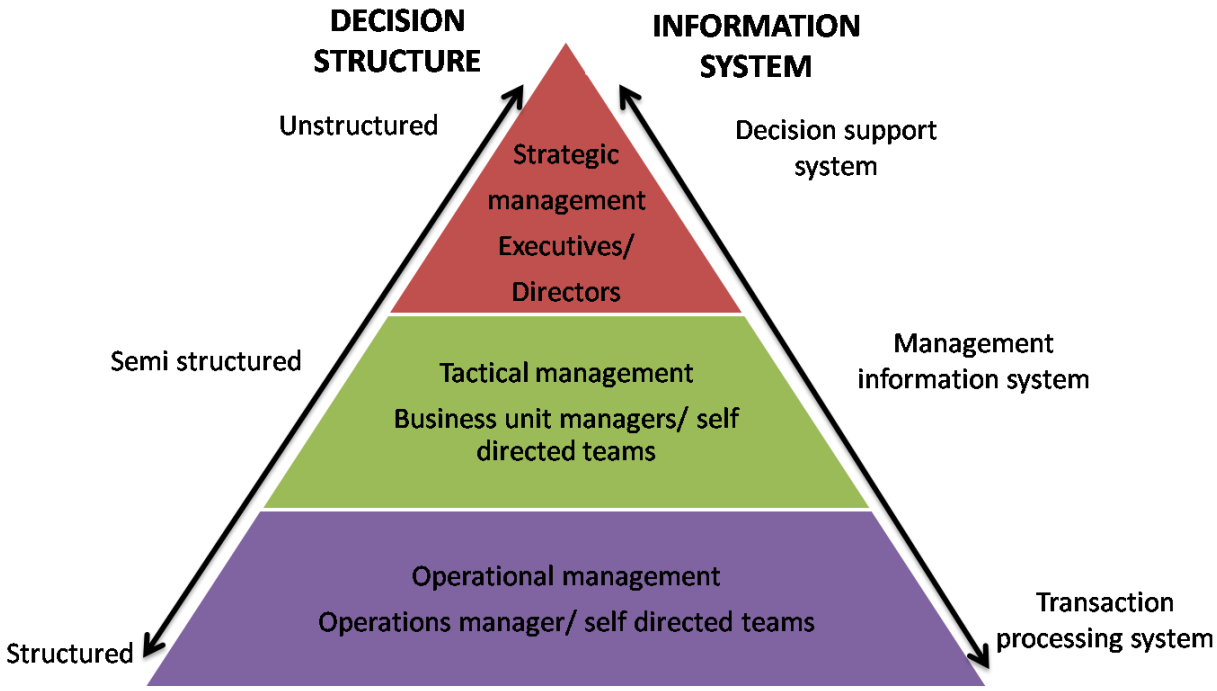


Fig: 4.6:-Information System Process

4.7 Managing Information Technology

Information technology management (IT management) is the process whereby all resources related to information technology are managed according to an organization's priorities and needs. This includes tangible resources like networking hardware, computers and people, as well as intangible resources like software and data. The central aim of IT management is to generate value through the use of technology. To achieve this, business strategies and technology must be aligned.

Information technology management includes many of the basic functions of management, such as staffing, organizing, budgeting and control, but it also has functions that are unique to IT, such as software development, change management, network planning and tech support.

Generally, IT is used by organizations to support and compliment their business operations. The advantages brought about by having a dedicated IT department are too great for most organizations to pass up. Some organizations actually use IT as the center of their business.

Fig: 4.7 :-Managing Information Technology

4.8 Enterprise & Global Management: Many firms are moving toward transnational strategies in which they integrate their global e-business activities through close cooperation and interdependence between their international subsidiaries and their corporate headquarters.

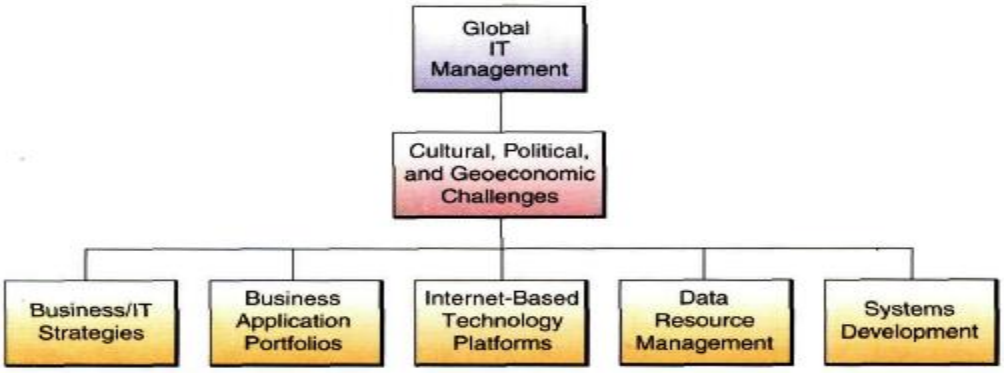


Fig:4.8:- Enterprise & Global Management

Businesses are moving away from:

- Multinational strategies where foreign subsidiaries operate autonomously.
- International strategies in which foreign subsidiaries are autonomous but are dependent on headquarters for new processes, products, and ideas.
- Global strategies, where a company's worldwide operations are closely managed by corporate headquarters.

A business depends heavily on its information systems and appropriate information technologies to help it integrate its global business activities. A transnational business tries to develop an integrated and cooperative worldwide hardware, software, and telecommunications architecture for its IT platform.

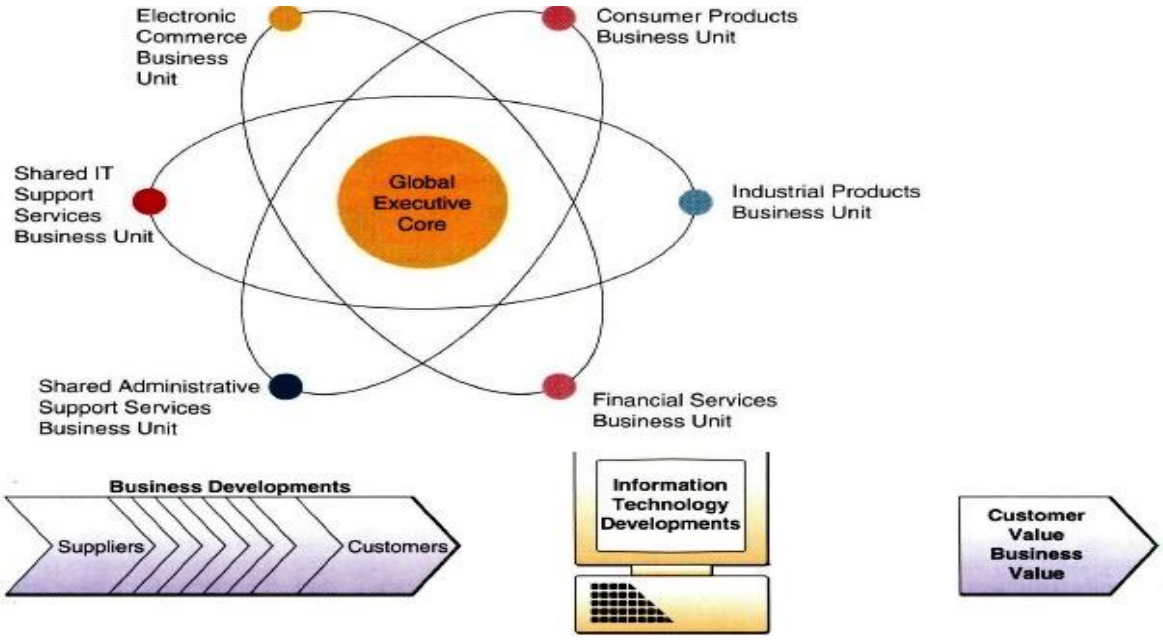


Fig:4.8.1:- Enterprise & Global Management System

The major dimensions of the job of managing global information technology include:

- e-Business/IT strategies
- e-Business application portfolios
- Internet-based technology platforms
- Data resource management
- Systems development

4.9 Security & Ethical Challenges

Information system security refers to the way the system is defended against unauthorized access, use, disclosure, disruption, modification, perusal, inspection, recording or destruction.

There are two major aspects of information system security −

- Security of the information technology used − securing the system from malicious cyber-attacks that tend to break into the system and to access critical private information or gain control of the internal systems.
- Security of data − ensuring the integrity of data when critical issues, arise such as natural disasters, computer/server malfunction, physical theft etc. Generally an off-site backup of data is kept for such problems.

Guaranteeing effective information security has the following key aspects −

- Preventing the unauthorized individuals or systems from accessing the information.
- Maintaining and assuring the accuracy and consistency of data over its entire life-cycle.
- Ensuring that the computing systems, the security controls used to protect it and the communication channels used to access it, functioning correctly all the time, thus making information available in all situations.
- Ensuring that the data, transactions, communications or documents are genuine.
- Ensuring the integrity of a transaction by validating that both parties involved are genuine, by incorporating authentication features such as "digital signatures".
- Ensuring that once a transaction takes place, none of the parties can deny it, either having received a transaction, or having sent a transaction. This is called 'non-repudiation'.
- Safeguarding data and communications stored and shared in network systems.

4.10 Information System Ethics

Ethics refers to rules of right and wrong that people use to make choices to guide their behaviors. Ethics in MIS seek to protect and safeguard individuals and society by using information systems responsibly. Most professions usually have defined a code of ethics or code of conduct guidelines that all professionals affiliated with the profession must adhere to.

In a nutshell, a code of ethics makes individuals acting on their free will responsible and accountable for their actions. An example of a Code of Ethics for MIS professionals can be found on the British Computer Society (BCS) website.

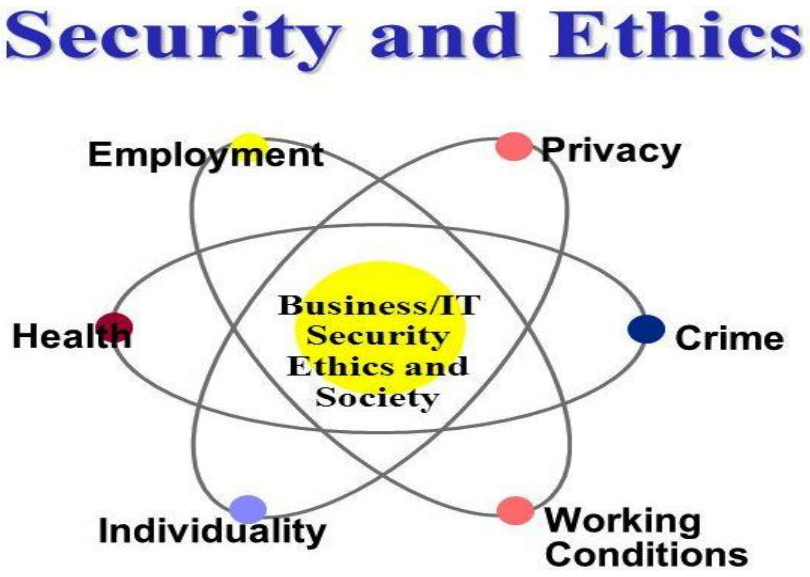


Fig: 4.10:-Information System Ethics

Information systems bring about immense social changes, threatening the existing distributions of power, money, rights, and obligations. It also raises new kinds of crimes, like cyber-crimes.

Following organizations promote ethical issues −

- The Association of Information Technology Professionals (AITP)
- The Association of Computing Machinery (ACM)
- The Institute of Electrical and Electronics Engineers (IEEE)
- Computer Professionals for Social Responsibility (CPSR)

4.11 Planning & Implementing Changes

Implementation of a system is as much important as the creation of it. Implementation can easily destroy the good work done in the earlier phases and bring the system to a standstill. Implementation requires technical and managerial skills as the implementers work as change agents. Implementation is also a process that has a series of sequential steps which culminates in making operational the new system.

Implementation as an activity has to be carefully managed. It requires client interaction at every stage. The implementers need the full support and cooperation of the client and the IS department functionaries to successfully execute the implementation of information systems. In order to help them perform this task of implementation smoothly, a series of predefined steps are followed. These implementation tasks are as follows:

Implementation Plan

It is the series of action-oriented steps planned for making the implementation smooth. It normally involves the following steps:

- Creating a master schedule of the implementation activities
- Setting timelines for critical and non-critical activities
- Identifying major bottlenecks and their solutions
- Communication of the plan.

This step is required to help the user community to understand the time frame for installation of the new system. Communication plays a vital role in the implementation and without proper communication especially, from the top management on the installation and implementation of the new system the change management will be difficult. Resistance to change related issues will come to the fore making the difficult task of implementation more difficult.

Communication of the plan of implementation to the user community helps the users to prepare for the change and makes them mentally prepared for it. The communication is required to be formal so that rumors cannot be spread about the system. The communication process may itself be in several phases. The top level can communicate the general intent of the new system and then detailed briefings to staff may be left to the divisional heads. The communication process also indicates (indirectly), the role each employee is required to play in the implementation process.

4.12 Organizing the MIS Department

The MIS department will be the custodian of the new system. Hence, they have to be gear up to support the new system. Organization of the department is therefore necessary before the new system becomes operational. The roles of each member of the MIS department have to be clearly laid out before the new system becomes operational. Effort is made to ensure that the role of the MIS staff is understood by each member of the organization. Training is provided to those who

need training on the new system so that they in turn can help others. This process of organizing the MIS department starts much before the actual implementation process begins as it entails some hiring and training which requires some lead time. The organization is done in such a timeframe that staff is available when the actual implementation starts. This enables the MIS staff to provide support to the implementation team, when the implementation process starts. This will also help the MIS staff to understand the nitty-gritty of the new system as they will be able to get a hands-on experience in the implementation of the new system.

Selection and Procurement of Hardware

This step of the implementation process is an important step as it involves huge investments. Proper care is taken to ensure that the organization gets the best deal from such selection and procurement of the hardware. The process of selection and procurement of hardware also varies greatly from firm to firm depending on the size of the firm and the sector in which it operates the type of management. However, the following procedure is followed:

- **Preparation of vendor list**-a list of reliable vendors is prepared. This list of vendors may be prepared after analyzing the vendor management experience of the organization with different vendors or may be prepared based on some accepted list of vendors in that business space prepared by some organization of repute or some industry body/regulatory body. The vendors that are selected to be part of the list are chosen carefully after a thorough checking of their credentials and goodwill in the market. This is essential as the vendor relationship is based on trust and compromise and not only on the basis of strict commercial terms.
- **Preparation of request for proposal (RFP)-**the implementation team must prepare the request for proposal document based on their understanding of the hardware requirement of the new system. The RFP must have complete technical details about the required hardware systems including specifications, format, performance expectation, and warranty and service quality requirements. This document is prepared by the implementers in consultation with the development team, management of the organization and the MIS team of the organization so that the need for each specification is well established and there is no scope for any difference of opinion. The consultative process results in the RFP which is a technical document. The RFP also has commercial details which the implementation team prepares in consultation with the management of

the organization. The RFP is a quasi-legal document in some countries and proper legal opinion is normally sought before sending it to the enlisted vendors.

- **Request for bids/proposal to select** vendors-after the RFP is prepared it is sent by some mode of communication to the enlisted set of vendors. The communication medium can be an open advertisement in print or electronic media or may be in the form of a letter to the vendors with a deadline for submission of the proposal.
- **Evaluation of RFP-**this is a difficult process. After bids are received before the deadline, they are checked (preliminary check) for basic errors. Those found to be prima facie proper are then evaluated. Several methods of evaluation exist. The evaluation could be on the basis of cost alone or quality alone or may be a mix of both cost and quality. Typically, a score based system of evaluation is used to rank the vendors' proposals. Scores are assigned to each attribute of a vendor's proposal like cost, goodwill, track record and service quality guarantee. Based on the weight age given to each attribute a composite score is prepared, which is used to evaluate the proposals. Whatever tJ1emethodology for evaluating the proposal, one must take care to apply the same evaluation criteria to all proposals. Different yardsticks should not be applied to different proposals.
- **Selection of vendor-**based on the evaluation a single vendor or a select set of vendors are chosen for delivery of hardware. Contract negotiations and price negotiations are held with this select group of vendors and following the successful completion of the negotiations the final contract will be signed.

4.13 Procurement of Software

The new system being implemented will have been created based on assumptions of operating environment of the organization. Procurement of system software is done on similar lines as the procurement of hardware. The only difference in the case of procurement of software is that the choice of what software to purchase is already made at the design stage of the system development and hence, the RFP preparation process is straightforward. The implementation team need not prepare the specification for the system software. They only need to procure the system software that the new system is designed to run on. The rest of the process is almost similar to the hardware procurement process.

Creating the Database

The new system to be implemented will have data stores. In modern systems, data stores are databases. These databases are relational database management systems, which is a separate application software package. The database has to be created and structures inside the database have to be created in order to enable it to store data. The implementation team creates the database, its structures and rules so that the application system being implemented can be plugged into the database and start working.

Training of Users

Implementation is a larger issue than installation. The new system may get installed but without proper training of users, it may not be of good use. Implementation is a larger concept and focuses on the installation and hand-holding part of the transition process. A training needs assessment is done to understand the training needs of the users. A training programme is planned and the required training given to users. This is an important part of the implementation process and helps in reducing the resistance to change related behavior among the user community. The training also helps users to appreciate the new features of the new system and helps build trust and appreciation for the new system.

Creating Physical Infrastructure

The new system being implemented may require a physical infrastructure. The implementation team must ensure that the system performance must not suffer due to infrastructure bottlenecks. The implementers will have to use their persuasive skills and convince the management of the organization to create the required physical infrastructure so that it does not affect the performance of the new system.

Transition to the New System

This is the last step in the implementation process. The transition if done wrongly leads to a lot of pain. Hence, it is necessary to move slowly on the transition front. Normally, after the new system is installed and ready, the new system and the old system are both used for a period to ensure that the company performance does not suffer due to transition problems. Slowly when the users gain more capability to handle the new system the old system is phased out.

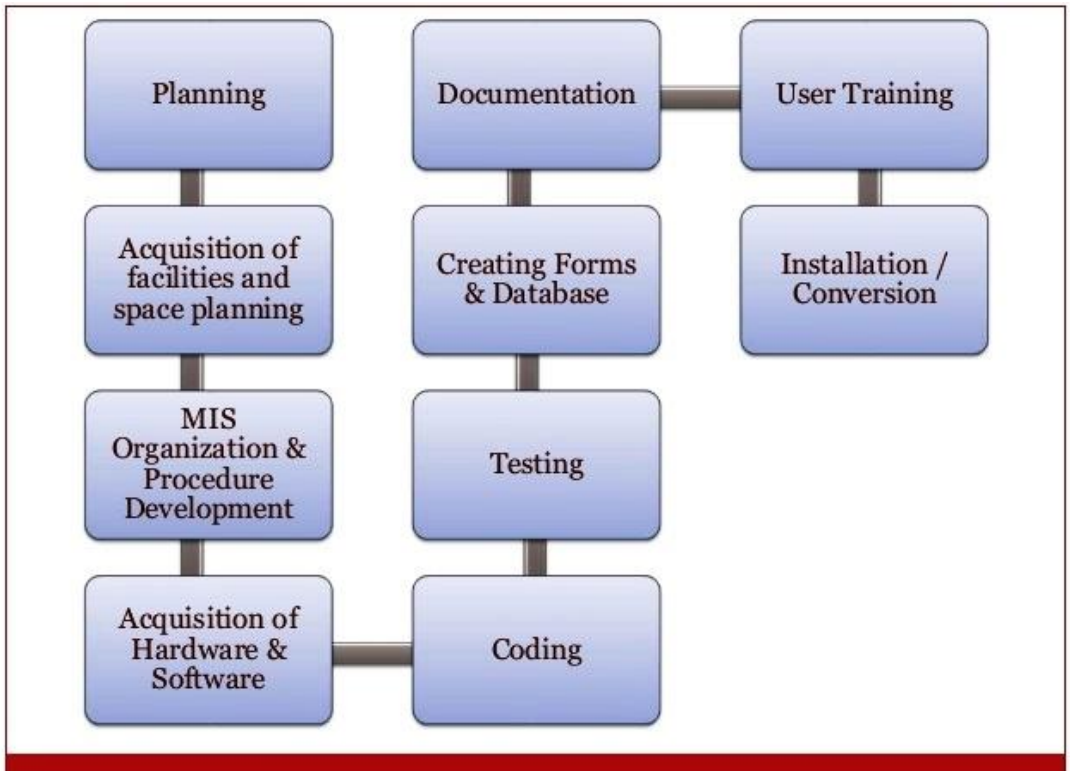


Fig: 4.13: Procurement of Software System

Descriptive Type Questions

1. What is Internet? Explain the advantages of internet.
2. Explain E-Commerce.
3. What are the various benefits of E-Commerce?
4. Differentiate between Intranet and Extranet.
5. Explain the term security & Ethical challenges.
6. Write the role of Information system for management decisions.
7. What do you mean by decision making?
8. Discuss the various job opportunities in the field of IT.
9. What are the security measures that a company can use to manage their security?
10. Piracy & Privacy are the biggest issues created by the information technology – Justify.

Chapter-5

Advanced Concepts in Information Systems

5. Advanced Concepts in Information Systems

5.1 ERP (Enterprise Resource Planning):

Enterprise resource planning (ERP) is business process management software that allows an organization to use a system of integrated applications to manage the business and automate many back office functions related to technology, services and human resources.

ERP software typically integrates all facets of an operation — including product planning, development, manufacturing, sales and marketing — in a single database, application and user interface.

ERP software is considered to be a type of enterprise application, that is software designed to be used by larger businesses and often requires dedicated teams to customize and analyze the data and to handle upgrades and deployment.

ERP software typically consists of multiple enterprise software modules that are individually purchased, based on what best meets the specific needs and technical capabilities of the organization. Each ERP module is focused on one area of business processes, such as product development or marketing.

Some of the most common ERP modules include those for product planning, material purchasing, inventory control, distribution, accounting, marketing, finance and HR. A business will typically use a combination of different modules to manage back-office activities and tasks including the following:

- Distribution process management
- Supply chain management
- Services knowledge base
- Configure prices
- Improve accuracy of financial data
- Facilitate better project planning
- Automate the employee life-cycle
- Standardize critical business procedures

- Reduce redundant tasks
- Assess business needs
- Accounting and financial applications
- Lower purchasing costs
- Manage human resources and payroll

As the ERP methodology has become more popular, software applications have emerged to help business managers implement ERP in to other business activities and may incorporate modules for CRM and business intelligence, presenting it as a single unified package.

The basic goal of using an enterprise resource planning system is to provide one central repository for all information that is shared by all the various ERP facets to improve the flow of data across the organization.

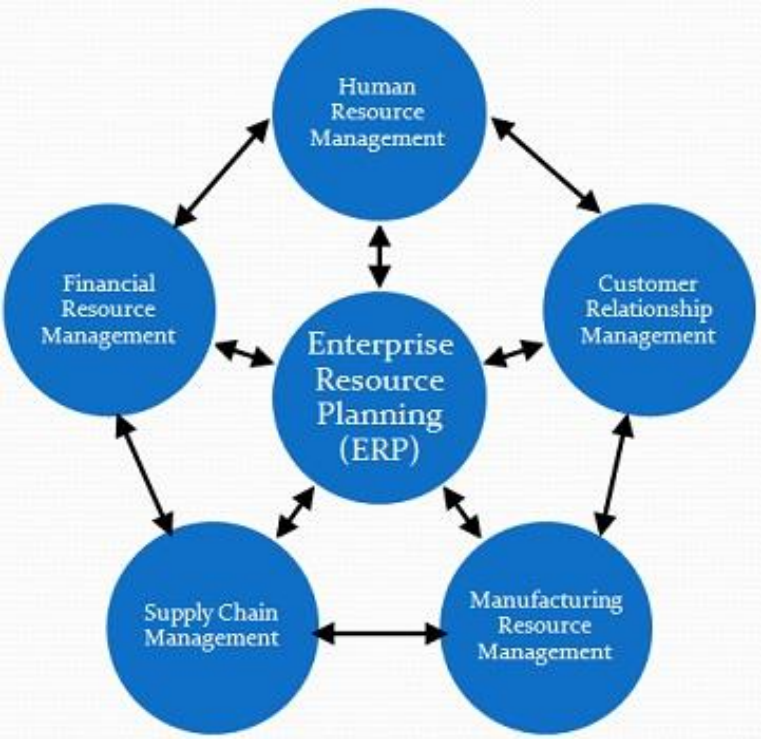


Fig: 5.1:-ERP System

5.2 Supply Chain Management

Supply chain management is the management of the flow of goods and services and includes all processes that transform raw materials into final products. It involves the active streamlining of a business's supply-side activities to maximize customer value and gain a competitive advantage in the marketplace. SCM represents an effort by suppliers to develop and implement supply chains

that are as efficient and economical as possible. Supply chains cover everything from production to product development to the information systems needed to direct these undertakings.

Breaking Down Supply Chain Management (SCM)

Typically, SCM attempts to centrally control or link the production, shipment, and distribution of a product. By managing the supply chain, companies are able to cut excess costs and deliver products to the consumer faster. This is done by keeping tighter control of internal inventories, internal production, distribution, sales, and the inventories of company vendors. SCM is based on the idea that nearly every product that comes to market results from the efforts of various organizations that make up a supply chain. Although supply chains have existed for ages, most companies have only recently paid attention to them as a value-add to their operations.

Supply Chain

A supply chain is the connected network of individuals, organizations, resources, activities, and technologies involved in the manufacture and sale of a product or service. A supply chain starts with the delivery of raw materials from a supplier to a manufacturer and ends with the delivery of the finished product or service to the end consumer. SCM oversees each touch point of a company's product or service, from initial creation to the final sale. With so many places along the supply chain that can add value through efficiencies or lose value through increased expenses, proper SCM can increase revenues, decrease costs, and impact a company's bottom line.

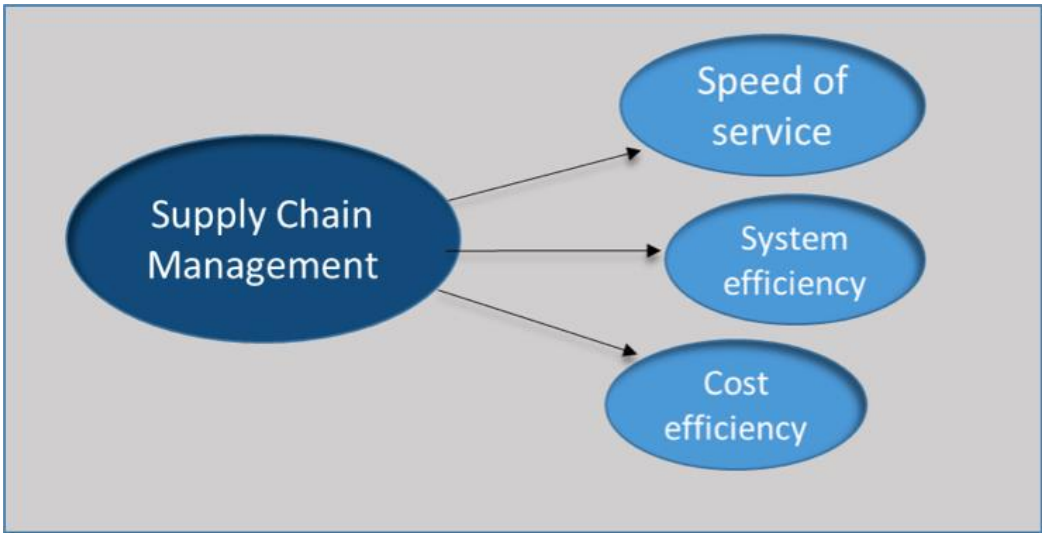


Fig: 5.2-Supply chain management (SCM)

Supply chain management (SCM) is the broad range of activities required to plan, control and execute a product's flow, from acquiring raw materials and production through distribution to the final customer, in the most streamlined and cost-effective way possible.

SCM encompasses the integrated planning and execution of processes required to optimize the flow of materials, information and financial capital in the areas that broadly include demand planning, sourcing, production, inventory management and storage, transportation -- or logistics -- and return for excess or defective products. Both business strategy and specialized software are used in these endeavors to create a competitive advantage.

Supply chain management is an expansive, complex undertaking that relies on each partner -- from suppliers to manufacturers and beyond -- to run well. Because of this, effective supply chain management also requires change management, collaboration and risk management to create alignment and communication between all the entities.

In addition, supply chain sustainability -- which covers environmental, social and legal issues, in addition to sustainable procurement -- and the closely related concept of corporate social responsibility -- which evaluates a company's effect on the environment and social well-being -- are areas of major concern for today's companies.

5.3 Logistics vs. supply chain management

The terms supply chain management and logistics are often confused or used synonymously. However, logistics is a component of supply chain management. It focuses on moving a product or material in the most efficient way so it arrives at the right place at the right time. It manages activities such as packaging, transportation, distribution, warehousing and delivery.

5.4 Benefits of supply chain management

Supply chain management creates efficiencies, raises profits, lowers costs, boosts collaboration and more. SCM enables companies to better manage demand, carry the right amount of inventory, deal with disruptions, keep costs to a minimum and meet customer demand in the most effective way possible. These SCM benefits are achieved through the appropriate strategies and software to help manage the growing complexity of today's supply chains.

Fig: 5.4:- Supply chain management System

5.5 The role of Supply chain management (SCM)

Technology is critical in managing today's supply chains, and ERP vendors offer modules that focus on relevant areas. There are also business software vendors that focus specifically on SCM. A few important areas to note include:

- Supply chain planning software for activities such as demand management.
- Supply chain execution software for activities such as day-to-day manufacturing operations.
- Supply chain visibility software for tasks such as spotting and anticipating risks and proactively managing them.
- Inventory management software for tasks such as tracking and optimizing inventory levels.
- Logistics management software and transportation management systems for activities such as managing the transport of goods, especially across global supply chains.
- Warehouse management systems for activities related to warehouse operations.

5.6 Customer Relationship Management (CRM)

CRM or Customer Relationship Management is a strategy for managing an organization's relationships and interactions with customers and potential customers. A CRM system helps companies stay connected to customers, streamline processes, and improve profitability.

Customer relationship management (CRM) is the combination of practices, strategies and technologies that companies use to manage and analyze customer interactions and data throughout the customer lifecycle, with the goal of improving customer service relationships and assisting in customer retention and driving sales growth. CRM systems compile customer data across different channels, or points of contact between the customer and the company, which could include the company's website, telephone, live chat, direct mail, marketing materials and social media. CRM systems can also give customer-facing staff detailed information on customers' personal information, purchase history, buying preferences and concerns.

5.7 Components of CRM

At the most basic level, CRM software consolidates customer information and documents into a single CRM database so business users can more easily access and manage it.

Over time, many additional functions have been added to CRM systems to make them more useful. Some of these functions include recording various customer interactions over email, phone, social media or other channels; depending on system capabilities, automating various workflow automation processes, such as tasks, calendars and alerts; and giving managers the ability to track performance and productivity based on information logged within the system.

- **Marketing automation:** CRM tools with marketing automation capabilities can automate repetitive tasks to enhance marketing efforts at different points in the lifecycle. For example, as sales prospects come into the system, it might automatically send the prospects marketing materials, typically via email or social media, with the goal of turning a sales lead into a full-fledged customer.
- **Sales force automation:** Sales force automation tools track customer interactions and automate certain business functions of the sales cycle that are necessary to follow leads and attract and obtain new customers.
- **Contact center automation:** Designed to reduce tedious aspects of a contact center agent's job, contact center automation might include prerecorded audio that assists in

customer problem-solving and information dissemination. Various software tools that integrate with the agent's desktop tools can handle customer requests in order to cut down on the time of calls and to simplify customer service processes.

- **Geolocation technology or location-based services:** Some CRM systems include technology that can create geographic marketing campaigns based on customers' physical locations, sometimes integrating with popular location-based GPS apps. Geolocation technology can also be used as a networking or contact management tool in order to find sales prospects based on a location.
- **Workflow automation:** CRM systems help businesses optimize processes by streamlining mundane workloads, enabling employees to focus on creative and more high-level tasks.
- **Lead management:** Sales leads can be tracked through CRM, enabling sales teams to input, track and analyze data for leads in one place.
- **Human resource management (HRM):** CRM systems help track employee information, such as contact information, performance reviews and benefits within a company. This enables the human resource department to more effectively manage the internal workforce.
- **Analytics:** Analytics in CRM help create better customer satisfaction rates by analyzing user data and helping create targeted marketing campaigns.
- **AI:** Artificial intelligence (AI) technologies, such as Sales force Einstein, have been built into CRM platforms to automate repetitive tasks, identify customer buying patterns to predict future customer behaviors and more.

Fig: 5.7:- Customer Relationship Management System & Its Components

5.8 CRM Challenges

For all of the advancements in CRM technology, without the proper management, a CRM system can become little more than a glorified database in which customer information is stored. Data sets need to be connected, distributed and organized so that users can easily access the information they need. For the majority of the headways in CRM innovation,

For the majority of the headways in CRM innovation, without the best possible administration, a CRM framework can turn out to be minimal in excess of a celebrated database in which client data is put away. Informational collections should be associated, circulated and sorted out with the goal that clients can without much of a stretch access the data they need. Organizations may battle to accomplish a solitary perspective on the client if their informational indexes are not associated and composed in a solitary dashboard or interface. Challenges additionally emerge when frameworks contain copy client information or obsolete data. These issues can prompt a decrease in client experience because of long hold up times during telephone calls, inappropriate treatment of specialized help cases and different issues. CRM frameworks work best when organizations invest energy tidying up their current client information to take out copy and inadequate records before they supplement CRM information with outside wellsprings of data.

On the following aspects the CRM should concern: 1. Decisions Management 2. Old habits should be changes 3. Integrations 4. Some special requirements 5. Importing of Data 6. Others – security concerns, CRM management champion, constant updating, bad vendor experiences, expecting too much too soon, integrations concerns, technology updating, lack of adequate budget etc.

5.9 Procurement Management

Procurement management is the systematic approach used for buying all the goods and services needed for a company to stay sustainable. Manage your procurement well, and it will add value to all your business practices and save you both time and money.

Procurement Management Information System (PMIS) is a smart system which collects stores and synthesizes the procurement related information all over the country. It is an online based central and integrated data management system concerning to the procurement activities.

Today, different organizations employ various management techniques to carry out the efficient functioning of their departments. Procurement management is one such form of management, where goods and services are acquired from a different organization or firm.

All organizations deal with this form of management at some point in the life of their businesses. It is in the way the procurement is carried out and the planning of the process that will ensure the things run smoothly.

But with many other management techniques in use, is there any special reason to use this particular form of management to acquire goods and services? Yes, this is one of the frequent questions asked regarding procurement management.

Procurement management is known to help an organization to save much of the money spent when purchasing goods and services from outside. It also has several other advantages.

5.10 How Does Procurement Management Works?

Following are the four main working areas of concerns when it comes to procurement management. The following points should be considered whenever procurement process is involved:

- Not all goods and services that a business requires need to be purchased from outside. It is for this reason that it is very essential to weigh the pros and cons of purchasing or renting these goods and services from outside.
- You would need to have a good idea of what you exactly require and then go on to consider various options and alternatives. Although there may be several suppliers, who provide the same goods and services, careful research would show you whom of these suppliers will give you the best deal for your organization.
- The next step typically would be to call for bids. During this stage, the different suppliers will provide you with quotes.

This stage is similar to that of choosing projects, as you would need to consider different criteria, apart from just the cost, to finally decide on which supplier you would want to go with.

- After the evaluation process, you would be able to select the best supplier. You would then need to move on to the step of discussing what should go into the contract.

Remember to mention all financing terms how you wish to make the payments, and so on, so as to prevent any confusion arising later on, as this contract will be binding.

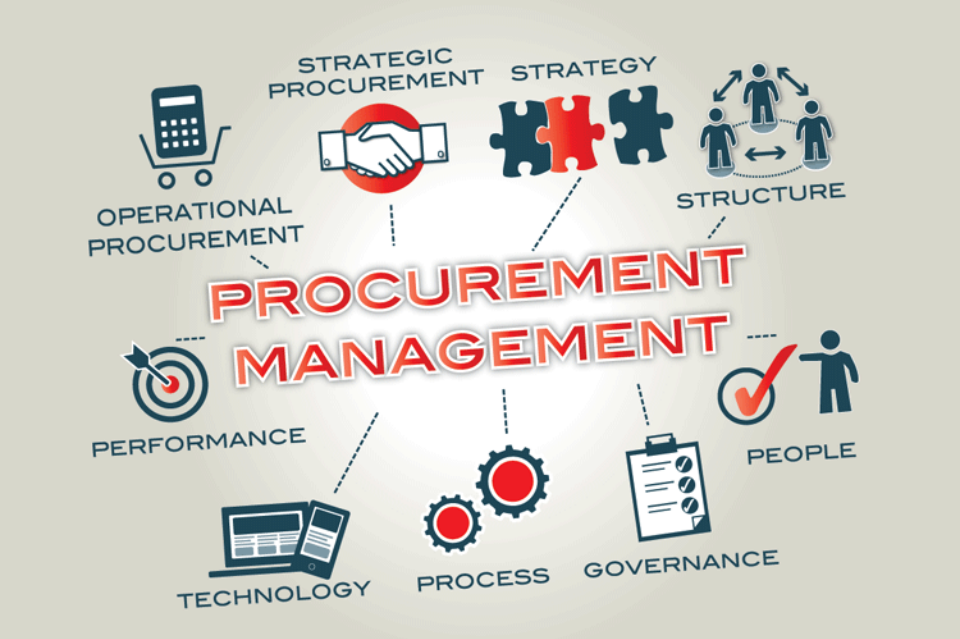


Fig: 5.10-procurement management

5.11 Procurement Management Process

This Procurement Management process will help you to purchase goods and services from external suppliers.

It gives you a complete procurement process and procurement procedures, which explain step-by-step, how to purchase from suppliers.

This procurement process will also help you to:

- Identify the goods and services to procure
- Complete Purchase Orders and issue to suppliers
- Agree on delivery timeframes and methods
- Receive goods and services from suppliers
- Review and accept the items procured
- Approve supplier payments

This Procurement Management Process will enable you to:

- Identify supplier contract milestones

- Review supplier performance against contract
- Identify and resolve supplier performance issues
- Communicate the status to management

Procuring goods and services from external suppliers can be a critical path for many projects. Often, the performance of the supplier will reflect on the performance of the overall project team. It's therefore crucial that you manage your supplier's performance carefully, to ensure that they produce deliverables which meet your expectations.

This Procurement Management Process will help you do this to get the most out of your external supplier relationships.

Descriptive Type Questions

1. Define ERP system. Discuss its importance and limitation.
2. What is Customer Relationship Management System?
3. Explain Supply Chain Management.
4. Differentiate between CRM & SCM.
5. Explain in detail computer crime & hacking as the biggest issue to the information system.
6. What is Procedure Management?
7. Explain the use of E-Commerce.
8. What is computer network? Discuss various types of computer network.
9. List and explain the various use of ERP System.
10. What are the principle technologies and standards for wireless networking, communication and Internet access?