KARNATAKA STATE OPEN UNIVERSITY
MUKTHAGANGOTRI, MYSORE- 570 006

DEPARTMENT OF STUDIES IN INFORMATION TECHNOLOGY

M.Sc IN INFORMATION TECHNOLOGY
II SEMESTER

MANAGEMENT INFORMATION SYSTEM
MSIT- 108

MSIT – 108

MANAGEMENT INFORMATION SYSTEMS

PREFACE

Information is a set of classified and interpreted data used in decision making. A management information system (MIS) is an integrated user-machine system for providing information to support operations, management and decision making functions in an organization. The system utilizes computers, manual procedures, models for analysis, planning, control and decision making, and a database. MIS facilitates managerial functioning. Management information is an important input at every level in the organization for decision making, planning, organizing, implementing, and monitoring and controlling. MIS is valuable because of its content, form and timing of presentation.

Organization of the material: The book introduces its topics in ascending order of complexity and is divided into four modules, containing four units each.

In the first module, we begin with the concept , role and impact of Management Information System, management effectiveness and system engineering concepts, general model of MIS, system development models and system analysis, information concepts and its classification.

The second module contains Development and implementation of the MIS, Organization for development of MIS, MIS development process model, Process Model of the Organization, Value stream model of the Organization, Relevance of information technology, Decision making concepts Decision making process Behavior concepts in decision making, Organizational Decision Making, Decision Structures and DSS Components.

The third module contains Planning for Competitive Advantages Business Models and planning, Business/IT planning, Identify Business/IT strategies, Implementation Challenges, System Development Life Cycle, Prototyping System, System Development Process, Implementing Business System, Client Server Architecture, Introduction to E-Business, Model of E-Business, Internet and world Wide Web, Intranet/Extranet, Electronic Intranet and extranet, Web enabled business management, MIS in web environment.

The fourth module contains ERP implementation life cycle, Cross Functional Enterprise Applications, Real World Case, Functional Business System, Sales Force Automation, Computer-Integrated Manufacturing (CIM), Human Resource Management (HRM), . Online Accounting System, Customer Relationship Management, Enterprise Resource Planning, Supply Chain Management.

Happy reading to all the students.

Karnataka State Open University

Mukthagangothri, Mysore – 570 006
Second Semester M.Sc in Information Technology
Management Information Systems

Module 1

Module 2

Module 3

Module 4

UNIT -1: INTRODUCTION TO MANAGEMENT INFORMATION SYSTEMS

Structure

1.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Understand about Management Information concept

- Analyze about Physical and Conceptual views of MIS

- Understand about Role of management

- Discuss about the different users of MIS

- Understand about the Impact of management

1. INTRODUCTION:

A **Management Information System** (**MIS**) provides information that is needed to manage organizations efficiently and effectively. Management Information System involve three primary

resources: people, technology, and information or decision making. Management information systems are distinct from other information systems in that they are used to analyze operational activities in the organization. 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.

1.1. MANAGEMENT INFORMATION SYSTEM (MIS) CONCEPT

The concept of the MIS has evolved over a period of time comprising many different facets of the organizational function. MIS is a necessity of all the organizations. The initial concept of MIS was to process data from the organization and present it in the form of reports at regular intervals. The system was largely capable of handling the data from collection to processing. It was more impersonal requiring each individual to pick and choose the processed data and use it for his requirements. This concept was further modified when a distinction was made between data and information. The information is a product of an analysis of data. This concept is similar to a raw material and the finished product. While taking decision we need information and not mass of data. The processed data delivers information. However, the data can be analyzed in a number of ways, producing different shades and specifications of the information as a product. It was, therefore, demanded that the system concept be an individual- oriented, as each individual may have a different orientation towards the information. This concept was further modified, that the system should present information in such a form and format that it creates an impact on its user, provoking a decision or an investigation. It was later realized that even though such an impact was a welcome modification, some sort of selective approach was necessary in the analysis and reporting. Hence, the concept of exception reporting was imbibed in MIS.

The concept of MIS gives high regard to the individual and his ability to use information. An MIS gives information through data analysis. While analyzing the data, it relies on many academic disciplines. These include the theories, principles and concepts from the Management Science, Psychology and Human Behavior, making the MIS more effective and useful. These academic disciplines are used in designing the MIS, evolving the decision support tools for modeling and decision - making. The foundation of MIS is the principles of management and its practices. MIS uses the concept of Management Information System which can be evolved for a

specific objective, after a systematic planning and design. It calls for an analysis of a business, management views and policies, organization culture and the culture and the management style. The information should be generated in specific setting and must be useful in managing the business. This is possible only when it is conceptualized as system with an appropriate design. The MIS, therefore, relies heavily on the systems theory which offers solutions to handle the complex situations of the input and output flows. It uses theories of communication which helps to evolve a system design capable of handling data inputs, process, and outputs with the lest possible noise or distortion in transmitting the information form a source to a destination. It uses the principles of system Design, Viz., an ability of continuous adjustment or correction in the system in line with the environmental change in which the MIS operates. Such a design help to keep the MIS tuned with the business managements needs of the organization. The concept, therefore, is a blend of principle, theories and practices of the Management, Information and System giving rise to single product known as Management Information System (MIS). The conceptual view of the MIS is shown as a pyramid in Fig.1.1. The Physical view of the MIS can be seen as assembly of several subsystems based on the databases in the organization. These subsystems range from data collection, transaction processing and validating, processing, analyzing and storing the information in databases. The subsystem could be at a functional level or a corporate level. The information is evolved through them for a functional or a department management and it provides the information for the management of business at the corporate level. The physical view of the MIS can be shown as in Fig.1.2.
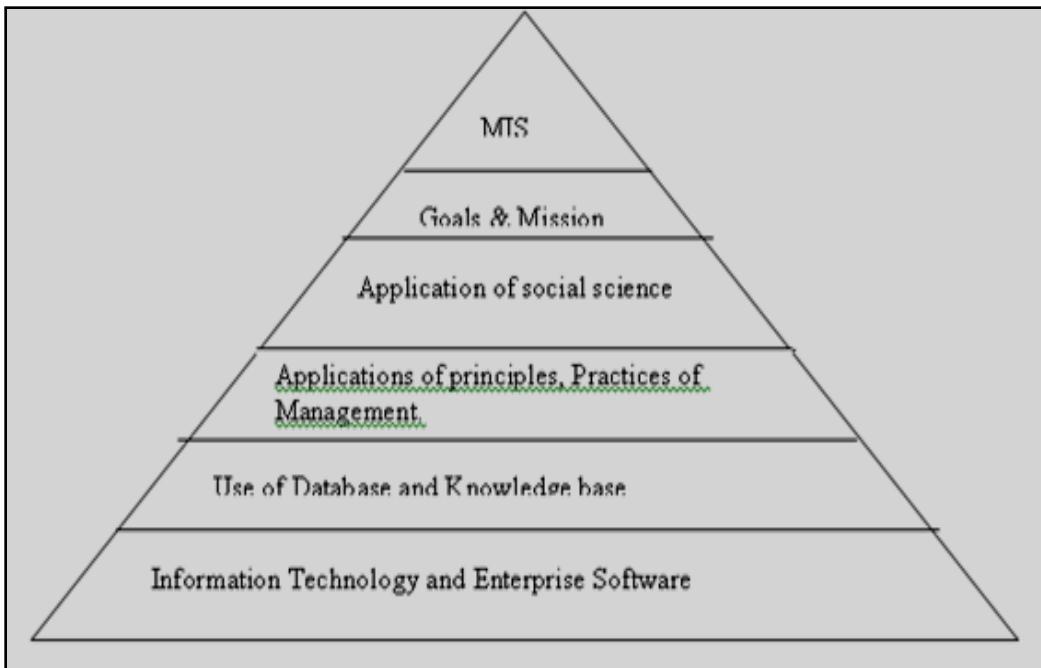
Fig.1.1. Conceptual view of MIS
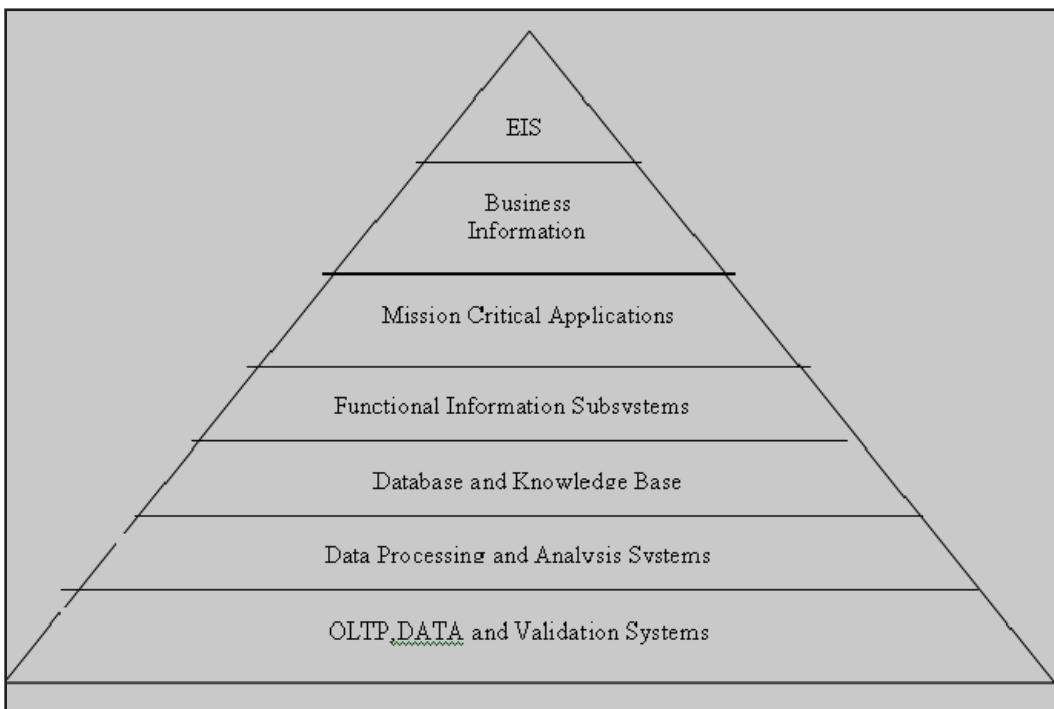
Fig. 1.2 Physical view of MIS

The MIS therefore, is a dynamic concept subject to change, time and again, with a change in the business management process. It continuously interacts with the internal and the external environment of the business and provides a corrective mechanism in the system so that the

changes in the needs of information are effectively done . The MIS model of the organization changes over a time as the business passes through several phases of developmental growth cycle. It supports the management of the business in each phase by giving the information which is crucial in that phase. It has critical success factors in each phase of growth cycle and the MIS model gives more information on the critical success factors for decision making.

1.2 MIS DEFINITION

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

Though 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. 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 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.

1.3 ROLE OF THE MANAGEMENT INFORMATION SYSTEM

The role of the MIS in an organization can be compared to the role of heart in the body. The information is the blood and MIS is the heart. In the body the heart plays the role of supplying pure blood to all the elements of the body including the brain. The heart works faster and supplies more blood when needed. It regulates and controls the incoming impure blood, processes it and sends it to the destination in the quantity needed. The MIS plays exactly the same role in the organization. The system ensures that an appropriate data is collected from the various sources, processed, and sent further to all the needy destinations. The system is expected to fulfill the information needs of an individual, a group of individuals, the management functionaries: the managers and the top management.

The MIS satisfies the diverse needs through a variety of systems such as Query Systems, Analysis Systems, Modeling Systems and Decision Support Systems the MIS helps in Strategic Planning, Management Control, Operational Control and Transaction Processing. The MIS helps the clerical personnel in the transaction processing and answers their queries on the data pertaining to the transaction, the status of a particular record and references on a variety of documents. The MIS helps the junior management personnel by providing the operational data

for planning, scheduling and control, and helps them further in decision making at the operations level to correct an out of control situation. The MIS helps the middle management in short term planning, target setting and controlling the business functions. It is supported by the use of the management tools of planning and control. The MIS helps the top management in goal setting, strategic planning and evolving the business plans and their implementation. The MIS plays the role of information generation, communication, problem identification and helps in the process of decision making. The MIS, therefore, plays a **vital role** in the management, administration and operations of an organization.

1.4 IMPACT OF THE MANAGEMENT INFORMATION SYSTEM

Since the MIS plays a very important role in the organization, it creates an impact on the organization's functions, performance and productivity. The impact of MIS on the functions is in its management. With a good support, the management of marketing, finance, production and personnel become more efficient. The tracking and monitoring of the functional targets becomes easy. The functional, managers are informed about the progress, achievements and shortfalls in the probable trends in the various aspects of business. This helps in forecasting and long- term perspective planning. The manager's attention is brought to a situation which is exceptional in nature, inducing him to take an action or a decision in the matter. A disciplined information reporting system creates a structured data and a knowledge base for all the people in the organization. The information is available in such a form that it can be used straight away or by blending analysis, saving the managers valuable time. The MIS creates another impact in the organization which relates to the understanding of the business itself. The MIS begins with the definition of a data entity and its attributes. It uses a dictionary of data, entity and attributes, respectively, designed for information generation in the organization. Since all the information system use the dictionary, there is common understanding of terms and terminology in the organization that brings clarity in the communication and a similar understanding. The MIS calls for a systemization of the business operation for an effective system design.

Since the MIS works on the basic systems such as transaction processing and databases, the drudgery of the clerical work is transferred to the computerized system, relieving the human mind for better work. It will be observed that a lot of manpower is engaged in this activity in the

organization. It you study the individual's time utilization and its application; you will find that seventy per cent of the time is spent in recording, searching, processing and communication. This is a large overhead in the organization. The MIS has a direct impact on this overhead. It creates an information- based work culture in the organization.

1.5 MIS AND THE USER

Every person in the organization is a user of the MIS. The people in the organization operate at all levels in the hierarchy. A typical user is a clerk, an assistant, an officer, an executive or a manager. Each of them has a specific task and a role to play in the management of business. The MIS caters to the needs of all persons. The main task of a clerk is to search the data, make a statement and submit it to the higher level. A clerk can use the MIS for a quick search and reporting the same to higher level. An assistant has the task of collecting and organizing the data, and conducting a rudimentary analysis of integrating the data from different disciplines to analyze it and make a critical comment if anything adverse is found. The MIS offers the methods and facilities to integrate the data and report the same in a proper format.
An executive officer plays the role of a decision maker. He is responsible for achieving the target and goals of the organization. The MIS provides facilities to analyze the data and offers the decision support systems to perform the task of execution. The MIS provides an action oriented information.

The manager has a position of responsibility and accountability for the business results. His management role expands beyond his management function. He is a strategist and a long-term planner. He is a person with a foresight, an analytical ability and is expected to use these abilities in the functions of top management. The MIS provides information in a structured or unstructured format for him to react. The MIS caters to his constant changing needs of information. The user of the MIS is expected to be a rational person and the design of the MIS is based on this assumption.

The enterprising managers are able to use the systems and the models for trying out a number of alternatives in a given problem situation. The impact of the MIS on people of the organization is phenomenal as it has made the same body of people collectively more effective and productive. The recent major technological advances in communication such as Multimedia, Imaging, Graphical User Interfaces (GUI), Internet, Web etc., provides the ability to access the data stored at different locations using varieties of platforms. An intelligent user of information can demonstrate the ability of decision making, since his manipulative capability is considerably increased, with the information now being available on his desktop. Through the MIS, the information can be used as a strategic weapon to counter the threats to business, make business more competitive, and bring about the organizational transformation through integration. A good MIS also makes an organization seamless by removing all the communication barriers.

1.6 MANAGEMENT INFORMATION SYSTEM AND COMPUTER

Translating the real concept of the MIS into reality is technically, an infeasible proposition unless computers are used. The MIS relies heavily on the hardware and software capacity of the computer and its ability to process, retrieve communicate with no serious limitations. The variety of hardware having distinct capabilities makes it possible to design the MIS for a specific situation. For example, if the organization needs a large database and very little processing, a computer system is available for such a requirement. Suppose the organization has multiple business location at long distances and if the need is to bring the data at one place, process, and then send the information to various location, it is possible to have a computer system with a distributed data processing capability. If the distance is too long, then the computer system can be hooked through a satellite communication system. The ability of the hardware to store data and process it at a very fast rate helps to deal with the data volumes, its storage and access effectively. The ability of the computer to sort and merge helps to organize the data in a particular manner and process it for complex lengthy computations. Since the computer is capable of digital, graphic, word image, voice and text processing, it is exploited to generate information and present it in the form which is easy to understand for the information user. The ability of a computer system to provide security of data brings a confidence in the management

in the storage of data on a magnetic media in an impersonal mode. The computer system provides the facilities such as READ ONLY where you cannot delete to UPDATE. It provides an access to the selected information through a password and layered access facilities. The confidential nature of the data and information can be maintained in a computer system. With this ability, the MIS become a safe application in the organization.

The advancement in computers and the communication technology has made the distance, speed, volume and complex computing an easy task. Hence, designing the MIS for a specific need and simultaneously designing a flexible and open system becomes possible, thereby saving a lot of drudgery of development and maintenance of the system. The concept of user . friendly systems and the end user computing is possible, making information processing a personalized function. However, the application of the management principles and practices in todays complex business world is possible only when the MIS is based on computer system support.

1.7 MANAGEMENT INFORMATION SYSTEM AND ACADEMICS

The management information system draws a lot of support from other academic disciplines too. The foundation of MIS is the management theory. It uses the principles and practices of management while designing the system, and gives due regard to the theory of organizational behavior.It considers the human mind as a processor of information. While designing the report format and forming communication channels, MIS takes into account the behavior of the manager as an individual and in a group. It gives due regard to the personal factors such as bias, thinking with a fixed frame of reference, risk aversion, strengths and weaknesses.

Another area of academics is operational research. The operational research is used for developing the models of management and they are then incorporated in the MIS as decision support systems. The inventory control, queuing theory, and resource programming are used in the MIS as decision support systems. The network theory is used for planning and controlling large projects. The application of PERT / CPM to a project planning is now easily possible through the MIS support. In the area of accounting application, it uses the accounting principles to ensure that the data is correct and valid. It uses the principles of double entry bookkeeping for balancing the accounts. It uses the accounting methodology for generating a trial balance sheet

and other books of accounts. The MIS is based on database structures, viz .hierarchical, network and relational database have roots in the mathematics and the set theory.

1.8 MANAGEMENT AS A CONTROL SYSTEM

Planning, organizing staffing, co-ordinating, directing and controlling are the various steps in a management process. The management experts have viewed these steps as management control system. They postulate the hypothesis that unless a control is exercised on the process, the goals will not be achieved. They advocate a system of effective control to ensure the achievement of the business objective.

A definition of control is the process through which managers assure that actual activities conform to the planned activities, leading to the achievement of the stated common goals. The control process measures a progress towards those goals, and enables the manager to detect the deviations from the original plan in time to take corrective actions before it is too late. Robert J.Mockler defines and points out the essential elements of the control process. The basic steps of the control process are given in fig. 1.3.
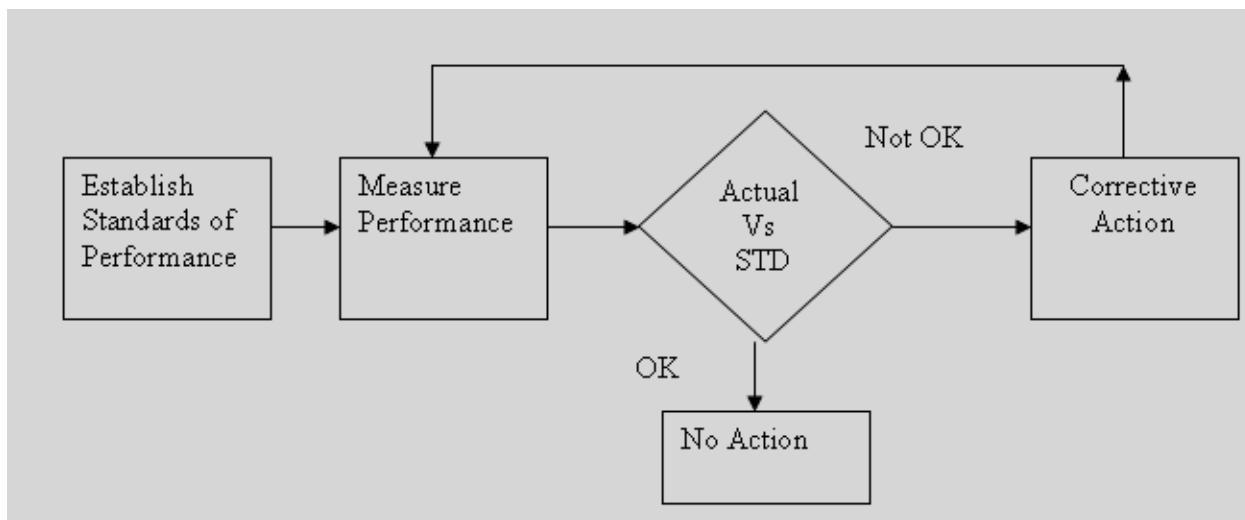
Fig.1.3. Process Flow of Control System

According Robert J Mockler a reliable and effective control system has the following features.

- **Early Warning Mechanism:**

This is a mechanism of predicting the possibility of achieving the goals and the standards before it is too late and allowing the manager to take corrective actions.

- **Performance Standard:**

The performance standard must be measurable and acceptable to all the organization. The system should have meaningful standards relating to the work areas, responsibility, and managerial functions and so on.

- **Strategic controls:**

In every business there are strategic areas of control known as the critical success factors. The system should recognize them and have controls instituted on them.

Feedback:

The control systems would be effective, if it continuously monitors the performance and send the information to the control center for action. IT should not only highlight the progress but also the deviations.

- **Accurate and Timely:**

The system should be realistic so that the cost of control is far less than the benefits. The standards are realistic and are believed as achievable. Sufficient incentive and rewards are to be provided to motivate the people.

- **The information Flow**

The system should have the information flow aligned with the origination structure and decision makers should ensure that the right people get the right information for action and decision making

- **Exception principle**

The system should selectively approve some significant deviations from the performance standards on the principle of management by exception. The system as a whole should be flexible to be changed with ease so that the impact of the changed environment is handled effectively.

1.9. MIS: A SUPPORT TO THE MANAGEMENT

The management process is executed through a variety of decisions taken at each step of planning, organizing, staffing, directing co-coordinating and control. The decisions required to be taken in these steps are tabulated in table 1.1.

Table 1.1. Decisions in Management

Steps in Management	Decision
Planning	A Selection from various alternatives – strategies, resources, methods etc
Organization	A Selection of a combination of several combinations of the goals, people, resources, method and authority
Staffing	Providing a proper manpower complement
Directing	Choosing a method from the various methods of directing their efforts in the organization
Coordinating	Choice of the tools and the techniques for co-ordinating the efforts for optimum results
Controlling	A selection of the exceptional conditions and the decision guidelines.

The objective of the MIS is to provide information for a decision support in the process of management. It should help in such a way that the business goals are achieved in the most efficient manner. Fig 1.4 discusses the process discussed above.
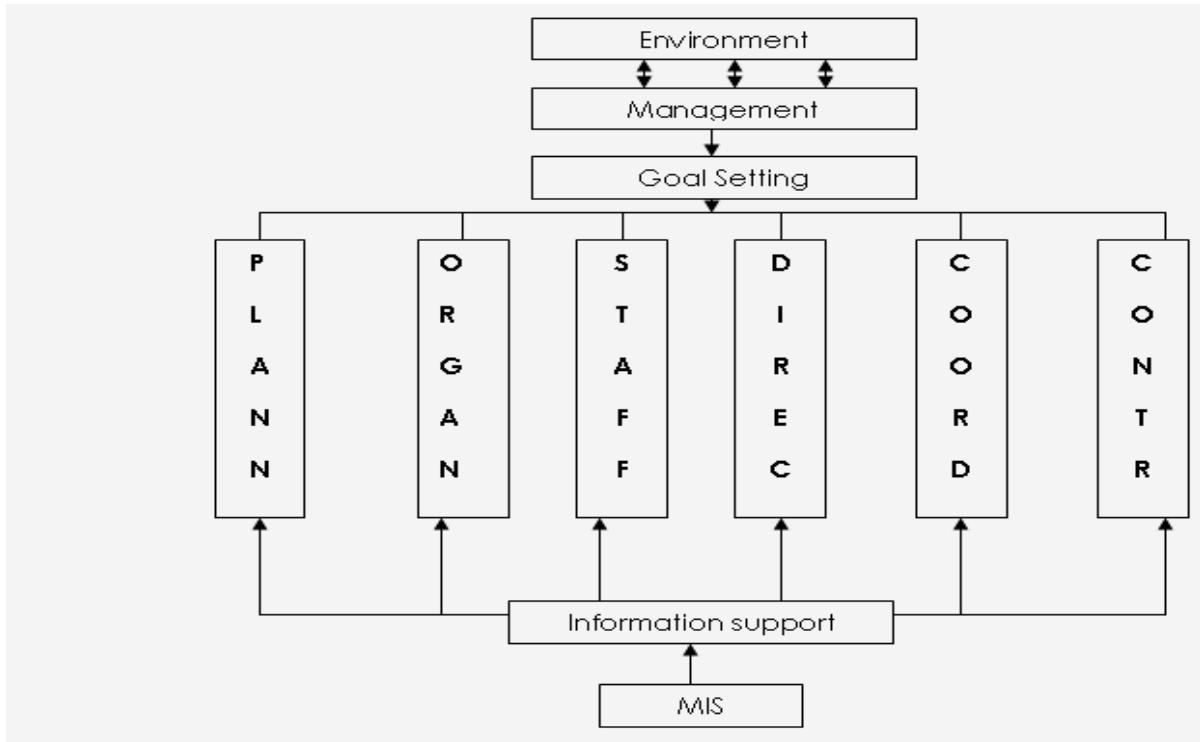
Fig. 1.4. MIS Support to Management Process

1.10. SUMMARY

This unit provides a brief introduction to Management Information System, and its different definitions. This also introduces the usages of MIS in different sectors like computers, in academics, as a simple user giving the different perception of MIS.This unit briefs about the different approaches suggested by Frayol and Taylor for managing the information. The different functions supported by the management process and the functions of the management are discussed in brief in their sections.

1.11. KEY WORDS

Information systems, Conceptual, Physical, Management as users, Role of MIS, Intelligent users, graphical users, Feedback system, closed and open systems.

1.12. EXERCISE

1) What is the scope of information system and Management Information system?

2) Give three reasons for using computer for MIS in the organization?

3) Discuss issues related to designing an MIS for an organization?

4) Can you think of an MIS which could be user independent and business dependent?

5) State the difference between MIS and a computer system.

6) Consider an organization of your knowledge and give a conceptual view of MIS and physical view of MIS.

7) State which capabilities of a computer are used in MIS to create an impact.

8) Identify the nature of impact of MIS on people, organization and the management style.

9) MIS supports a manager in its functional responsibilities. Justify.

10) List the external environment in which a manager operates. How many of them have a direct impact on the management process and hence should be considered in the MIS design?

11) Explain the importance of management by exception. Can it be the only approach in managing the business?

12) List the decision involved in each phase of management process, starting from planning to control.

13) Explain the role of performance standard and feedback in effective management of business.

1.13. REFERENCES

1. Waman S.Jawadekar ,"Management Information Systems",VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

UNIT -2: MANAGEMENT EFFECTIVENESS AND SYSTEMS ENGINEERING

Structure

2.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Understanding about management
- Understand about Management importance and effectiveness
- Analyzing different process of management
- Different concepts used in systems engineering

2.1. INRODUCTION TO MANAGEMENT

Management as defined by Mary Follett is the art of getting things done through people. A manger is defined as a person who achieves the organization's goals by motivating others to perform not by performing himself. Whether management is an art or a science is a very subjective question. But it can be said without doubt that modern management in the environment of technology is becoming more of a science than an art. We define management for the purpose of Management information Systems as the process of planning, organizing, staffing, coordinating and controlling the efforts of the members of the organization to achieve common stated goals of the organization.

In the process of management, a manager uses human skills, material resources and scientific methods to perform all the activities leading to the achievement of goals. The management process involves a continuous resolution of conflicts of one kind or the other which affects the achievement of goals. In the management of any activity, a manager comes across human conflict, conflict of goals, between alternative resources, conflict of time, conflict of approach or method and the conflict of choice.

The manager uses a variety of tools, techniques and skills while executing the management process of planning, organizing, staffing, coordinating and controlling. An effective way of handling this process is to treat the organization as a system. The result oriented management approaches the problem of management through the system view of the organization.

The key concepts of the system theory used in the management are as follows:

1. A system is a comprehensive assembly of parts becoming an organization to achieve the stated goals.

2. A system is called OPEN if it has interaction with the environment and CLOSED if it does not have an interaction with the environment.

3. A system is defined, described and understood by the boundaries within which it performs.

4. The system are subject to entropy, i..e., the tendency to run down. Closed systems suffer from entropy as they are cut off from the environment, while open systems interact with the environment and draw upon the support of resources to maintain a given condition.

5. Systems try to remain in equilibrium or a steady state by taking recourse to corrective action. This is possible when the system has its own feedback, i.e., an informational input about the state of the system.

In the context of the MIS, the systems approach to management is the most efficient one. The understanding of the basic principle of management theory was evolved from the scholars Henri Fayol, Chester Barnard and Alvin Brown is very much essential. The application of management principles in an environment, recognizing the specific situation, is the accepted practice of management. Deviating from the principle to honor the situation and at the same time not diluting the management principle is the managerial skill. The manager must have knowledge of management theory and principle as the skill to use them in a particular environment.

2.2. MANAGEMENT EFFECTIVENESS AND MIS:

Negandhi Estafen provides a good model Fig 2.1 for the analysis of management effectiveness, which generates enterprise effectiveness in achieving their goals and objectives. The models puts a lot of emphasis on the management philosophy and environment factors on which the effectives is dependent. The environment factors provide the opportunities to survive and grow with certain constraints, while the management philosophy sets the guidelines for deciding the management practices of run the enterprise.
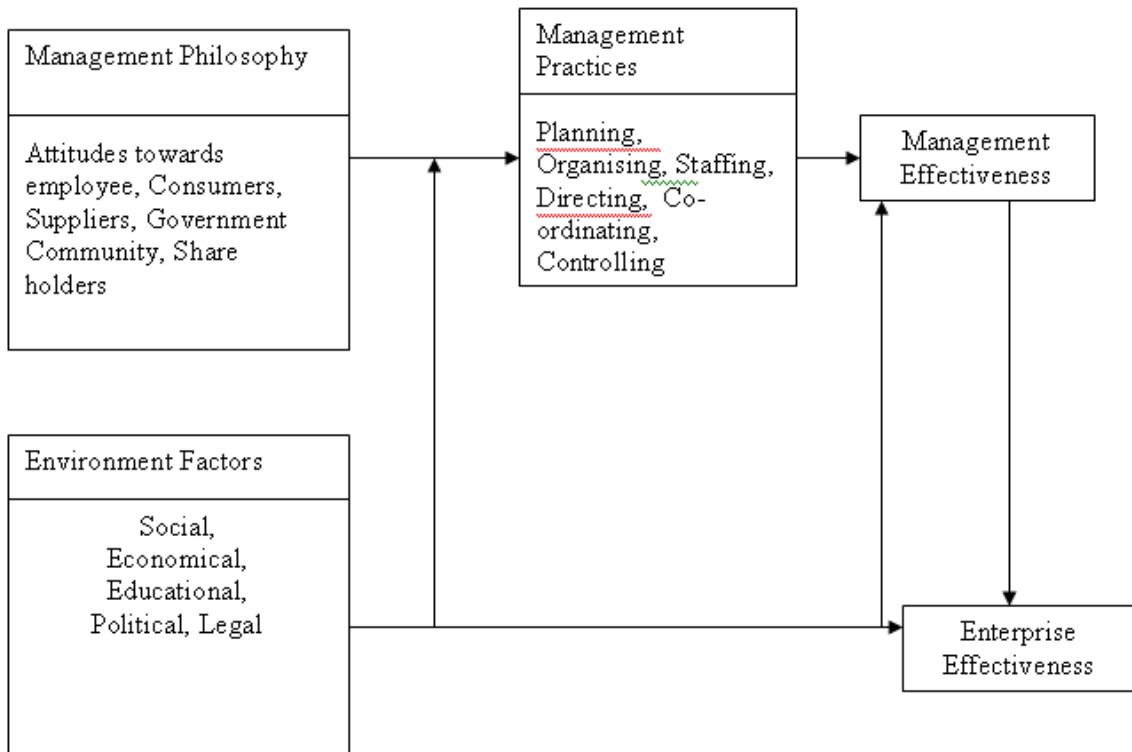
Fig. 2.1. Negondhi Estafen Model for Analysis of Management Effectiveness

While the environment factors are difficult to control, it is left for the management to change its philosophy towards the various players in the business, viz., the employees, the consumers, the suppliers the government, the community and the shareholders. Basically, it is a change in attitude towards these players. If the attitude towards the consumer is changed to fulfill the expectations giving rise to a higher satisfaction, then the management practices in the product design, manufacturing and marketing will undergo a significant change. The product life cycle will then be short, and more features and functions will be added to the product fulfilling not only the functional needs but also the service needs of the consumer. The management practices, therefore, emerge out of the management philosophy and the environment, in which it operates. The management effectiveness would largely depend on both these factors. The MIS design would, therefore, be different depending upon the management practices followed by several organizations in the same industry. Such design improves the management effectiveness leading to an improvement in the enterprise effectiveness.

2.3. MIS : ORGANISATION

Management information systems (MIS) should be designed, viewing the organization as discussed earlier. MIS design should give due weightage to the human side of the organization and its culture. The task and technology are the physical aspects of the organization which can be ascertained very easily. But culture and people are very difficult to assess from the design point of view. The structure of the five sub-systems should be considered while designing the MIS. MIS design should give reports in line with the organization structure. This means that the main decision makers and the power centers must be recognized in the MIS. Let us discuss these aspects of the organization structure and their implications.

In a tall hierarchy with a high degree of centralization, the MIS should give control information to the higher management where decision making in concentrated. If the system is structured on the functional basis where the functional head is a key decision maker and all the functions have equally important role to play, then the MIS will have a functional design with the information support to the functional head. Further, in such a set-up, an integrated MIS would be necessary, reporting the corporate status of the business to the top management.

If the organization works on a standardized system where rules, policies, systems and procedures have been laid down, then these become part of the MIS. The processing routines in the MIS incorporate these features as an integral part. This is safe as it has already been approved by the management of the organization. Along with the information, if the decision making responsibilities are also clearly defied and allocated, then the MIS can produce information reports by processing the data and summarizing the results in line with the decision makers position in the structure. The organizational learning helps to tone up the behavior of the organization. The MIS should support the learning mechanism by identifying the cause and effect in a given situation. It should keep the records of action and provide help to analyze the best action in a given situation. It should help to build various decision models for use by the managers. The information support should be such that the group of enterprising manager should be able to improve their capabilities to perform batter.

The design of the MIS, in isolation from organizational factors, is destined to fall as it just does not fit into the structure. Since organization systems in the same business differ for various

reasons such as the leadership style, the management style, culture and group of people as a body and so on, it is difficult to evolve a standard model of the MIS for a business and/or an industry. MIS plays a very important role in creating organization behavior which in turn sets the goals for achievement. Technology and people decide the organization structure and style of the management.

2.4. ORGANISATIONS AS A SYSTEM

A system is an assembly of elements arranged in a logical order to achieve the objectives of the organization. The individuals in the organization are selected in terms of number quality and ability and are placed in hierarchical order to Plan and execute the business activities to achieve certain goals and objectives. This is the Simplest justification for calling the organization a system. The management theorists however have seen organization in different views and perspectives. They have identified more elements in the systems besides the people. The choice of technology and structure are the additional elements of the organization system. He says that the task technology and people structure are dependent on each other and their signification cannot be ignored as elements of the system. The arrangement of task in terms of process and work design is dependent on the people. The choice of technology of handling the task is dependent on the people. You may choose the best technology and well designed task, but they have to be suited for the people. Over and above these are to be arranged in proper structure. Further a fourth Element has been added as culture. According to Leavitt an organization should be viewed as a socio- technical system consisting of people task technology culture and structure. The modified Leavitt.s model is shown in Fig. 2.2.
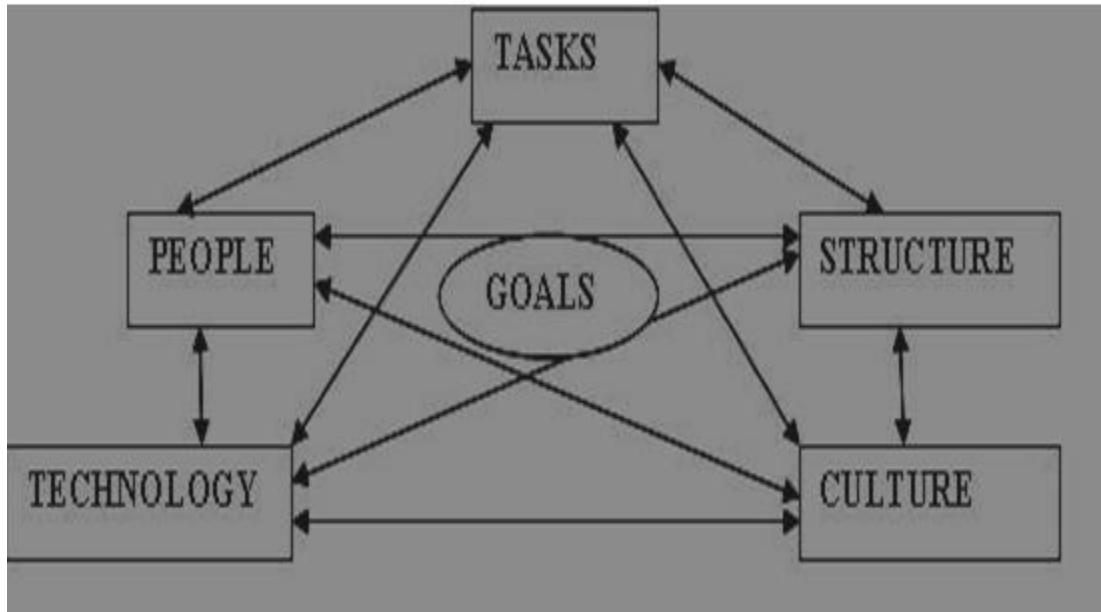
Fig. 2.2. Model of the Organization System.

Hence the organization is a socio-technical system whose sub-systems are task, people ,technology ,culture and structure, each having its own input and output satisfying the goals and objectives of the organization. If the sub-system's goals and objectives, are not congruent with the goals and objectives of the corporate organization, poor performance resistance to change and non- attainment of corporate goals will be the consequences.

2.5. SYSTEMS ENGINEERING: CONCEPTS

Systems in MIS can be treated in several forms. The concept related to system varies with different attributes treating the system as closed, open, stochastic, dynamic, static, deterministic or non deterministic systems. Hence the concepts of the system varies with the functions and the activates of the organization. The system concept mainly affects the performance of the organization.

The word system is used in day to day life very frequently in describing the subjects such as the traffic system, education system, business system, etc. The system provides a meaningful framework for describing and understanding the features and functions of the subject.

System is defined as a set of elements arranged in an orderly manner to accomplish an objective. Some examples are given in following table 2.1.

Table 2.1: Examples of system.

Systems	Elements	Objective
Computer	Input, process and output devices. Operating system, compliers packages	Process the data and provide information
Accounting	Financial transactions, accounting principles and rules, transaction processing methods of accounting	Process the transactions and produce monthly books of accounts and the information for financial management
Business organization	People plant and machinery product and services, communications, transport, materials	Produce goods and services to achieve the business objectives of service, turnover and profits.

It is to be noted that a system is not a randomly arranged set. It is arranged with some logic governed by rules, regulations, principles and policies. Such an arrangement is also influenced by the objective, the system desires to achieve. If a system in any field is analyzed, it will be observed that it has three basic parts, which are organized in an orderly manner. These three parts can be represented in a model as shown in fig.2.3.
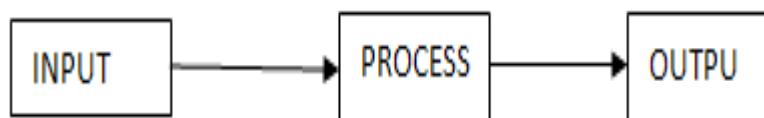
Fig. 2.3. Parts of a System

A system may have single input and multiple outputs or may have several inputs and outputs. All system operates in an environment. The environment may influence the system in its design and performance. When a system is designed to achieve certain objectives, it automatically sets the boundaries for itself. The understanding of boundaries of the system is essential to bring clarity in explaining the system components and their arrangement. A generalized model of the system in an environment will be as shown in fig.2.4. The environment influences the choice of inputs, the method of processing, and the nature and contents of the outputs. Since the system are designed for specific objectives/outputs and inputs the designer provides a filter around the system to control the influence on the system. The designer of the system therefore has to consider the environment and select appropriate inputs and filtering mechanism to protect the system for the undue or undesirable influences of the environment. Most of the failures of the systems lie in the area of selection of the inputs and the processes and not providing the appropriate filtering systems.
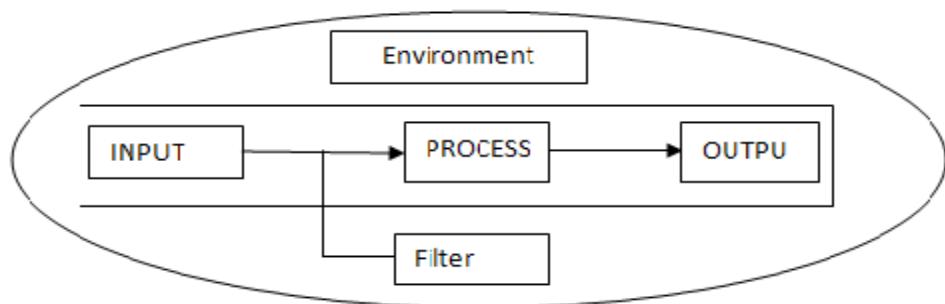
Fig. 2.4. Generalized Model of a system

2.6. SYSTEM CONTROL

Since the systems are designed to achieve specific objectives, ensuring the achievement of the objectives through system control, becomes the integral part of the system design. The control calls for, in the first place, a measurement of the output in some terms. The device that measures the output is called a sensor. The next step is to set the standard or norm of the output as an index of the system performance. The sensor measures the output and compares it with the standard. If the measured output compare well with the standard, then a feedback is provided to the system to stop the operations. The process of comparison of a measured

output with the standard is done by a unit called as comparison unit. The mechanism which provides a signal to the system, about the quality of performance, favorable or adverse, is called a feedback mechanism. The process of measuring the output, comparing with the standard, sending the signal to the corrective unit and corrective unit acting upon it, is called a control. Any break down in this path will affect the system performance adversely. The role of a control is to regulate the system operations and performance, and keep it in an equilibrium condition. The control, therefore, is the heart and brain of the system.

The control could either be internal or external to the system. For example, in an air conditioning system switching on and off of the compressor is automatic and hence it is an internal control. In the roads and traffic system the traffic policeman acts as a control system, which is external to the traffic system. Most of the modern systems have inbuilt automatic control systems.

The concept of control is based on the condition of a feedback. If the feedback is positive, i.e., the measure of the output compares favorably with the standard or norm., the control will keeps the system operating in the same condition. However, if the feedback is negative, i.e. the measure of the output is unfavorable when compared to the standard or norm; the control will act on the input or process to bring back the system to the state of equilibrium. The control system model with a control feature is shown in the fig.2.5.
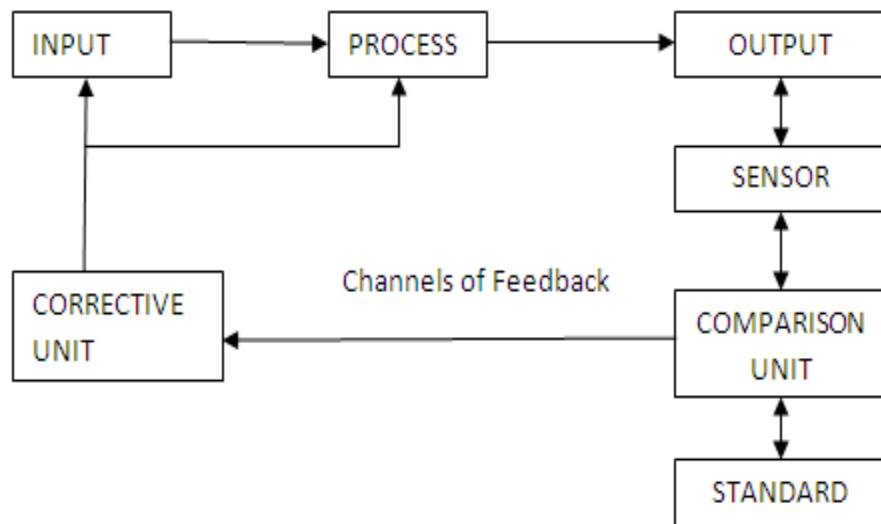
Fig.2.5. Control System Model

2.7. SUMMARY

This unit provides a brief introduction to Management effectiveness, MIS as an organization structure and its facilities. It also defines the different systems engineering concepts required during the design of the MIS. This chapter also defines the method to control the system model and different environment constraints in the design of the MIS system.

2.8. KEY WORDS

Information systems, Management effectiveness, Organization, Process, environment, open closed systems, system control, Feedback system,

2.9. EXERCISE

1) What is the scope of information system and Management Information system?

2) What are the components of a system? How is the system model improves from simple input process-output model to complex control model.

3)How do you relate and interact with external environment in the system? Is it possible to insulate the system from the influences of the external environment?

4) Classify the systems as either open or closed with reasons there of

   a) A chemist shop   b) ATM system c) Mail delivery system d) ERP system e) Milk distribution.

5) Identify the necessity of identifying the MIS as an organization of specifying the goals of people and structure of the MIS system.

2.10. REFERENCES

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

_____

UNIT -3: SYSTEMS CONCEPTS

Structure

3.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Define System concepts: Model, Types, and classes
- Analyze the Handling of systems complexity
- Identify the Post implementation system problems
- Types of Entropy
- Identify the need for system Analysis
- State the Systems Analysis and Design

3.1. INTRODUCTION TO TYPES OF SYSTEM:

Systems in MIS can be treated in several forms. The concept related to system varies with different attributes treating the system as closed, open, stochastic, dynamic, static, deterministic or non deterministic systems. Hence the concepts of the system varies with the functions and the activates of the organization. The system concept mainly affects the performance of the organization.

A system is defined and determined by its boundaries and objectives. It is quite likely that a system is an arrangement of smaller systems in a logical order. When many smaller systems together make a larger system, the smaller systems are called the subsystems of the larger system. A large system can be split or decomposed into smaller subsystems up to certain level. This decomposition can go down to a level where the input and the output are more or less same. The decomposition of a system into subsystems can in a serial form or it could be in a matrix form as shown in fig 3.1. and 3.2.
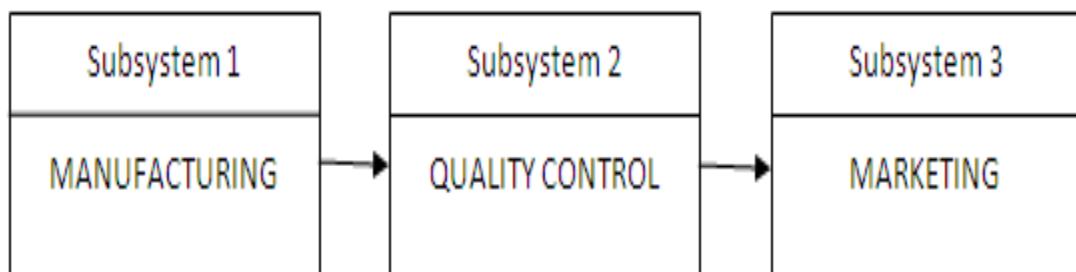
Fig.3.1. Subsystems in Serial Order
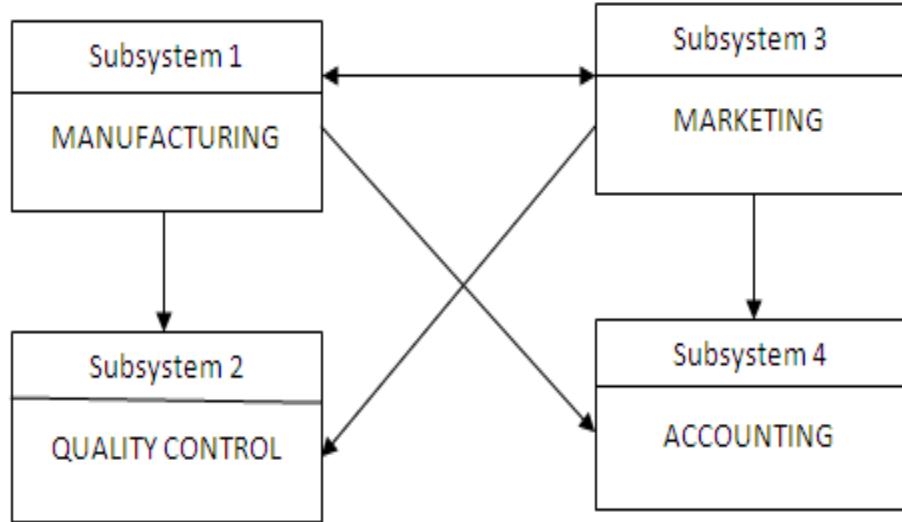
Fig. 3.2. Subsystems Operating in Matrix Order

In a serial system processing, the entire output of a subsystem is the input to the next subsystem and so on. In the matrix arrangement the different outputs go to different subsystems. A subsystem receives more than one input from other subsystems. In any system, the inputs are transformed into the output by the process. We say that the process is transparent to us when we are able to understand the system. But if, the process of input transformation is not visible and understandable then we say that the system is a black box and the process is not transparent as shown in fig. 3.3.

Fig. 3.3. Black Box System

The systems can be classified in different categories based on the predictability of its output and the degree of information exchange with the environment. A system is called deterministic when the inputs, the process and the outputs are known with certainty. In a deterministic system, you can predict the output with certainty. A system is called probabilistic, when the output can only be predicted in probabilistic terms. The accounting system is deterministic while the demand forecasting system is a probabilistic one. A

deterministic system operates in a predictable manner while a probabilistic system behavior is not predictable.

If a system is functioning is isolation from the environment, then the system does not have any exchange with the environment nor is it influenced by the environmental changes. Such a system is called a closed system. If the system has exchange with the environment and is influenced by the environment then it is called an open system.

All kinds of accounting system, viz., cash, stocks, attendance of employees are closed system. Most of the systems based on rules and principles are **closed system**. The systems which are required to respond to changes in the environment such as marketing, communication and forecasting are open systems. All open systems must have a self organizing ability and a sensitivity to absorb and adjust to the environmental changes. The business organization systems are open systems. The systems of manufacturing are closed styles.

3.2. HANDLING SYSTEM COMPLEXITY:

Information systems are relatively complex as compared to physical system, and therefore they should be handled properly enabling the system designer to understand, design develop and implement. To handle the complexity the system can be viewed as assembly of subsystems each with a clear definition of the boundaries, interface and their connectivity. The subsystems then are put in the hierarchical order to provide a structural view showing the developmental path to the designed. The process is called factorization of the system into subsystems.

Another method of handling the complexity is to resort to simplification by clustering the subsystems together. Handling all the subsystems, together with their interconnections is difficult. The number of interconnections increases with the increase in the number of subsystems. Each interconnection acts as a channel for the input output communication. The process of implication provides a way to handle these interconnections and reduce the complexity. The method of simplification is a follows:

i)   Identify the subsystems which have to be together for the functional cohesion

ii)   Form a cluster of these subsystems and identify interconnection is this cluster

iii)   Form clusters of the remaining subsystems.

iv)   Connect the clusters with an interface.

System Efficiency and Effectiveness:

The complex system performance can be measure by two factors, namely the efficiency and the effectiveness. The efficiency indicates the manner in which the inputs are used by the system. Being efficient means the system uses inputs in a right way. IF the input output ratio is adverse we say that the system is inefficient though it produces the desired output.

 The effectiveness is the measure for deciding whether the system provides the desired output or not. Being effective means producing the right output in terms of quantity and quality. When the system is ineffective, the system is out of control and it needs a major correction. A system has to be effective and efficient for the highest utility to the user of the system. Broadly speaking the effectiveness is a measure of the goodness of the output, while the efficiency is a measure of the productivity, i.e. the measure of the output against the input.

_____

3.3. CLASSES OF SYSTEMS
_____

We have discussed types of systems as closed/open and deterministic/ probabilistic. Further these systems perform different roles through different processes to achieve a system goal. Though at the core they satisfy all the attributes of a system, they differ in nature due to the goals assigned to them. This is more particularly true for the system in MIS. System, which form the part of MIS are classified in five classes as under.

- Data Processing system (DPS)
- Business Function Processing System (BPS)
- Transaction Processing System (TPS)
- Integrated Information Processing System (IPS)
- Application processing system (APS)

Data Processing system (DPS):

DPS is designed to capture, collect or enter the data to process in a certain specified in a certain specified manner to achieve the following:

Data is complete correct and valid from all aspects. Such data then is processed and organized in some form for further processing. DPS may have an algorithm using one or more data inputs and many produce one or more outputs.

Transaction processing system (TPS):

TPS is designed to handle a transaction between parties. The parties could be two or more and have a designated role in TPS. TPS uses data files, master files, transaction records and process the data in a manner specified in the transaction process designed to execute the transaction. TPS output is a transaction in itself and updating the various other records based on the result processed as a part of the transaction execution. Example Payroll system.

Application Processing System (APS):

Application processing system is built over DPS and TPS. APS uses files created by DPS and TPS, and applied application processing rules to execute the application. Application processing system may have an output as a document, a report, or a set of results required for processing further in business function system. For example, billing the customer is an application. This application system uses output files of the following TPS. i) Customer order acknowledgement ii) Delivery acknowledgement and acceptance by the customer ii) Product delivery to customer.

Business Function processing system (BPS):

BPS deals with business function. BPS aids in business function processing and helps management in decision making required within the scope of a business function. BPS focuses more through information support for management of business function. It brings out more MIS reports for business function management, such as sales, production materials, customer relations and so on. Business function is built on several business process applications. Business system uses relevant APS and TPS outputs for processing the system result.

Integrated Information Processing System (IPS):

Integrated information processing system sits on the top of the rest of the systems discussed so far namely DPS, TPS, APS, BPS. IPS draws its input from these systems, and applies information processing rules to bring out an output. IPS generally meets a requirement of top management in the area of planning, budgeting and strategic control. Systems like project planning, capital budgeting, manufacturing planning, and preparing yearend balance sheet schedules and reports are examples of IPS.

3.4. GENERAL MODEL OF MIS

 The MIS is an arrangement of data processing and information systems in an orderly manner to support the management in achieving the business objectives. The MIS boundaries cross the limits of the organization and draw the data from the sources external to the organization. MIS follows a generalized model of a system as stipulated in the theory and performs on the principle of feedback and control. It works on the principle of control by exception.

By nature, the MIS is an open system interfacing continuously with the internal and the external environment and is self organizing to meet the ever increasing and changing information needs of the organization. This is made possible by organizing the MIS in a hierarchical structure. Further it is sub divided into smaller subsystems. The decomposing is done on the various bases, viz the functional the departmental or the decision. It can also be decomposed on the basis of activity, viz the data collection, data analysis planning and control. The breaking up of the system into smaller subsystems is for understanding and determining the boundaries and for setting the objectives. The performance of the MIS design starts decaying the post implementation period and it is necessary to provide negative entropy to bring back the system to its original equilibrium. A good MIS is founded on the in-depth system analysis of the business and management process. It caters to the individuals, the groups, the functions and the different levels of the management in the organization.

3.5. THE NEED FOR SYSTEM ANALYSIS AND DESIGN

For an efficient system design the need for analysis stems from the following points of view:

System objective: It is necessary to define the systems objective(s).Many a times, it is observed that the systems are historically in operation and have lost their main purpose of achievement of the objectives. The users of the system and the personnel involved are not in opposition to define the objectives. To develop the computer based system, it is necessary to redefine or reset the objectives as are reference point in context of the current business requirement.

System boundaries:

It is necessary to establish the system boundaries which would define the scope and the coverage of the system. This helps to sort out and understand the functional boundaries of the system, the department boundaries in the system, and the people involved in the system. It also helps to identify the inputs and the outputs of the various subsystems covering the entire system.

System Importance:

It is necessary to understand the importance of the system in the organization. This would throw more light on its utility and would help the designer to decide the design feature.It would be possible then to position the system in relation to the other systems for deciding the design strategy and development.

Nature of the system:

The analysis of the system will help the system designed to conclude whether the system is to be closed type or an open and a deterministic or a probabilistic. Such an understanding of the system is necessary prior to design the process to ensure the necessary design architecture.

Understanding of Resource Needs:

The analysis of the system helps in defining the resource requirements in terms of hardware and software. Hence, if any additional resources are required, this would mean an

investment. The management likes to evaluate the investment form the point of view of return on such investment. If the return on the investment is not attractive the management may drop the project.

3.6. SYSTEM ANALYSIS OF THE EXISTING SYSTEM

When the objectives of the information system are finalized, as the first step towards development it is necessary to analyze the existing system. Such an analysis helps in achieving the following:

i)   Understanding the existing system

ii)   Understanding the objectives achieved by the existing system

iii)   Evaluating the system for computerization and its placement in the total MIS design

iv)   Knowing whether the system is feasible technically and operationally

v)   Are the information needs fully justified?

vi)   If so, is the cost of the system design justified to increase the value of the information.

3.7. SYSTEM ANALYSIS OF A NEW REQUIREMENT

It is not always necessary that the analysts are required to conduct the analysis of the Existing system. Sometimes it is necessary to analysis the requirement of the new systems. Then the analysts are called for re-designing the processes, practices and procedures. The information system development cycle for a new application consists of the five major stages which are explained in the following table 3.1.

Table 3.1. System Development Cycle

Stages in development cycle	Steps in each Stage	Purpose
Definition of the system and its objectives	Define the system and its elements and its boundaries and scope. Set the	The stage assures clarity to the users of the system and the system designer. The

	objectives of the system with respect the system design	terms of reference are also set.
Development of the system	System analysis of the similar system. Decision making needs are identified and corresponding information Needs are defined.	This step ensures that the information requirements are defined as a support to decision making.
	Structured break up of the system in the smaller subsystem/processes in hierarchical order for development	Helps to understand the system functioning and brings a clarity in the input and output of each subsystem
Installation of the system and testing	The system is tested and installed on the hardware for implementation. Switching over to computer system after thorough operational tasting.	The step ensures that there operational problems are resolved and the user gets live experience of the system. Modification, if any is carried out. Checks and controls are ensured through testing and the parallel runs.
Operations of the system	The system is operated in full course and existing systems (if any) discontinued	The user confidence is built and the designer simultaneously evaluates the performance of the computer system.
Review and Evaluation	A review is taken whether the system objectives are being met with and what are the problems in the smooth running. Steps are taken to resolve them.	This is an audit by the designer for the improvement through test data and audit trial.

Following the system development cycle approach is the best bet for the successful completion of any system project. The main advantage of the approach is that the process helps the analyst to conceive, develop, design and implement the system. Following the procedure provides the basis for management and control of the project as each step in the process is a well defined task.

3.8. SYSTEM DEVELOPMENT MODEL

In order to design a good system, traditionally, the developers have used the waterfall model as shown in fig.3.2.
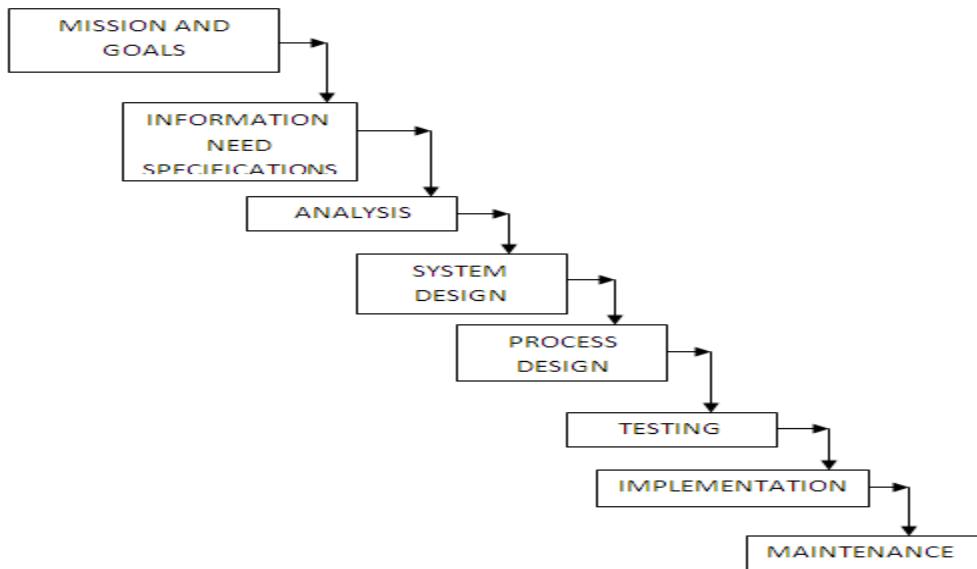
Fig. 3.2. Waterfall model

As waterfall flows from the top to the bottom, the system model shows the development process from the top to the bottom in steps. As water does not rise from a lower level to a higher level , it is presumed that once a step in the model is over, it is not required to go back. This model fits well when the changes into the requirement specifications are not required frequently. The minor changes can be taken care of through a maintenance process or through small design changes. The water fall model applies well to the basic rule based data and information processing systems in accounting materials, production and personnel.

However, some systems are more dynamic and require changes in specifications more often to continue to be useful. These modifications are termed as the versions of the basic model. One of the popular models developed by Boehm is a spiral model as shown in fig. 3.3.
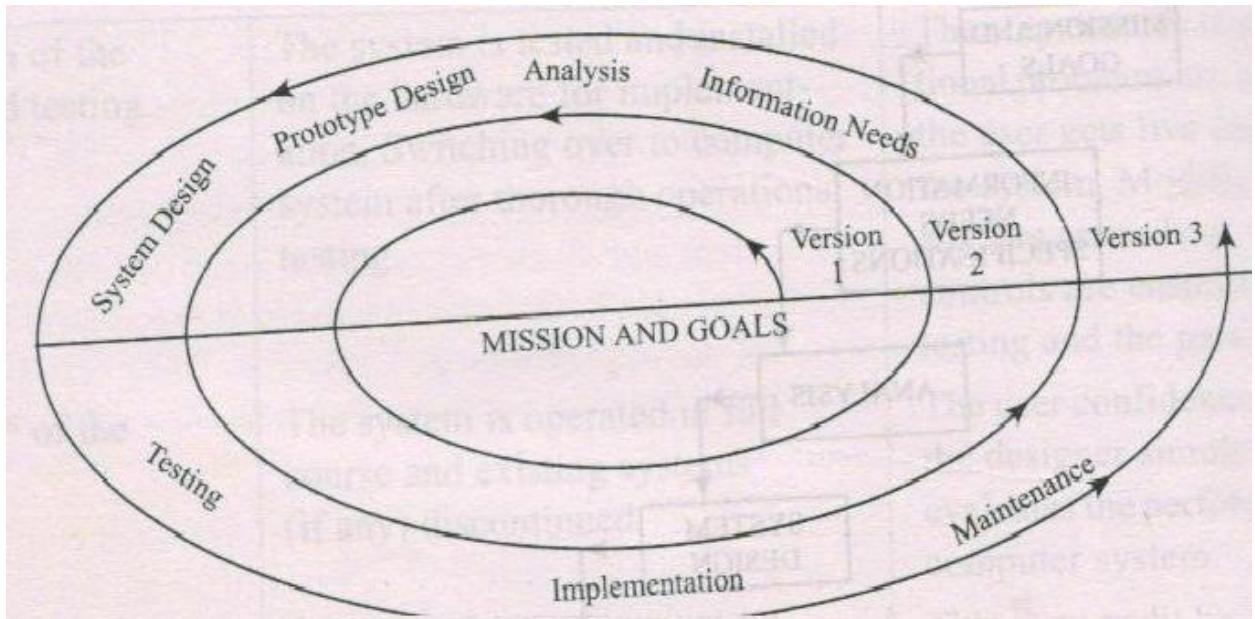
Fig. 3.3. Spiral Model

A spiral model fits well, when we are developing large systems, where the specifications cannot be ascertained in one stroke completely and correctly. Some of them get surfaced when the system is put to use after its testing. The continuous revision of these steps in the system development is very common and the designers call them as versions. The new version provides an additional functionality features and facilities to the user and addresses the issues of the users of the system viz performance, response, security and so on., irrespective of which development model is used in developing the system. The user wants the system to be user friendly, reliable and effective, and one which gives correct results, while the developer wants, the system easy to modify, easy to understand, portable and compatible to other system.

The definition of a good system varies with the systems environment. In some systems the performance is the key measure of a good system while in other cases the ability to change fast is a key measure of a good system. In some cases the user friendliness could be a measure of good system. In all the cases, however, the correctness of the result is a common measure, making them reliable and dependable for the business operations. The speed and response are the performance measures in case of large volume transaction based systems designed and for real time applications. The flexible design is a measure of performance where the system needs continuous modifications to meet the revised requirements of the specifications.

3.9. MIS AND THE SYSTEM ANALYSIS

Systems analysis plays a central role in the development of the MIS. Since the MIS is a conglomerate of the various systems's a systematic approach in its development helps in achieving the objective of the MIS. Each system within the MIS plays a role which contributes to the accomplishment of the MIS objective.

The tools of the systems analysis and the method of development force a discipline on the designer to follow the steps strictly as stipulated. The possibility of a mistake or an inadvertence is almost ruled out. The success of MIS lies in meeting the information needs of the various personnel in the organization across all levels of the management. The systems analysis with its structural analysis and design approach ensures an appropriate coverage3 of the subsystems. The data entities and attributes are considered completely keeping in view the needs of the systems in question and their interface with other systems. The system analysis begins with the output design itself ensures that the information needs are considered and displayed in the appropriate report or screen format; the subsequent design steps are taken to fulfill these needs. The MIS may call for an open system design. In such a case while making the systems analysis and design, the aspect of open system design is considered, and necessary modifications are introduced in the design of the information system.

3.10. SUMMARY

This unit describes the system and classes of the systems. Different types of systems like DPS, IPS, BPS and APS systems. This unit also describes about the complexity handling of different types of systems and their efficiency. Irrespective of the classes a general model of the system is described in this unit. This unit also discusses the system development life cycles with waterfall and spiral model.

3.11. KEY WORDS

System types, Classes of systems, Complexity of the system, Data processing system, transaction processing, business processing, Integration processing systems,requirement analysis of existing system and new system, General model of the system, Water fall model, spiral model .

3.12. EXERCISE

1) What are the components of a system? How the system model improves from simple input process-output model to complex control model.

2) How do you relate and interact with external environment in the system? Is it possible to insulate the system from the influences of the external environment?

3) What are the methods for handling the business systems for understanding, analyzing and design of MIS? What benefits do you get?

4) Apply your understanding of system concepts to organization and explain how they are used in organization as a system.

5) Classify the systems as either open or closed with reasons related to
   b) A chemist shop   b) ATM system c) Mail delivery system d) ERP system e) Milk distribution.

6) Explain the water fall model in the development of MIS.

7) Why spiral model is identified as a dynamic model in MIS, specify its merits and demerits.

3.13. REFERENCES

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.
 2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

UNIT -4: INFORMATION CONCEPTS

Structure

4.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Understand the Effectiveness of information presentation

- Understand the Quality of information

- Identify the Classes of Information

- Understand the Application of value concept to information

- Identify the Value of additional information

- Understand about the General Model of Information processor

- Identify Analyze the Differentiate between Data, Information and Knowledge

- Understanding the Information's concepts at different levels

- Identify the Requirements of the organization and information

- Understand the Implications of information

_____

4. INTRODUCTION:

_____

Information management (**IM**) is the collection and management of information from one or more sources and the distribution of that information to one or more audiences. This sometimes involves those who have a stake in, or a right to that information. Management means the organization of and control over the structure, processing and delivery of information. In short, information management entails organizing, retrieving, acquiring, securing and maintaining information. It is closely related to an overlapping with the practice of data management.

_____

4.1. INFORMATION CONCEPTS

_____

The word information. is used commonly in our day to day working. In MIS, information has a precise meaning and it is different from data. The information has a value in decision making while data does not have. Information brings clarity and creates an intelligent human response in the mind. In MIS a clear distinction is made between data and information. Data is like raw materials while the information is equivalent to the finished goods produced after processing the raw material. Information has certain characteristics. These are:

- Information
- Improves representation of an entity
- Updates the level of knowledge.
- Has a surprise value.
- Reduces uncertainty.
- Aids in decision making.

The quality of information could be called good or bad depending on the mix of these characteristics.Davis and Olson defines information as a data that has been processed into a form that is meaningful to the recipient and is of real or perceived value in the current or the prospective actions or decisions of the recipient. Data is defined as groups of non random

symbols in the form of text, images or voice representing quantities, actions and objects. Whether an entity is a data or information; it must be transferred through communication from the source to the destination without loss of content. The general model for such communication is given in fig.4.1.
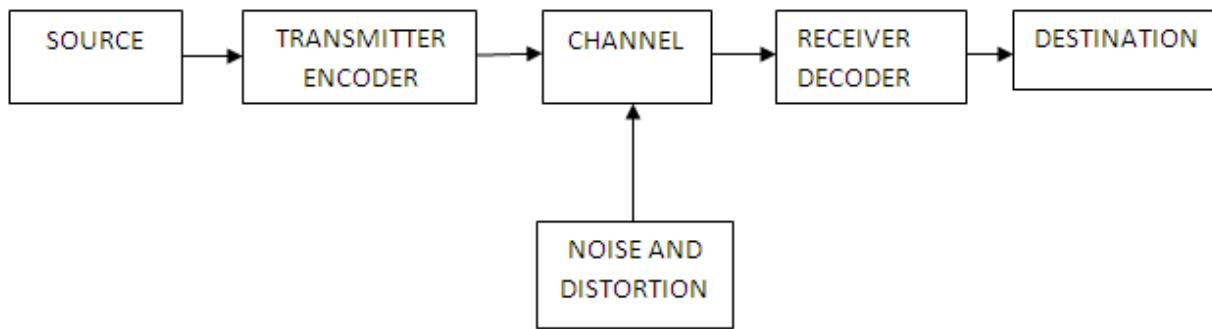
Fig. 4.1. Conceptual Model of Communication

The above model of communication is used in the MIS. The MIS is equivalent to the transmitter which provides information and sends through reports to the various receivers, which is decoded or interpreted by the receiver at the destination. The poor quality of information due to various factors would create confusion and misunderstanding, which is equivalent to a noise and a distortion in the communication model. A good MIS communicates the information without a noise and a distortion to the user. The information has certain attributes which represents the information a best set of information. The different attributes of information is discussed in table 4.1.

Table 4.1. Attributes of information:

Attribute	Explanation
The accuracy in representation	The test of accuracy is how closely it represents a situation or event. The degree of precision will decide the accuracy in representation
The form of presentation	Forms are qualitative or quantitative, numeric or graphic, printed or displayed, summarized or detailed. Appropriate form is important
The frequency of reporting	How often the information is needed? How often it needs to be updated

The scope of reporting	The coverage of information in terms of entities, area and range, and the interest shown by the recipient or the decision maker
The scope of collection	Internal from organization or external to organization
The time scale	It may relate to the past, the current and the future and can cover the entire time span
The relevance to decision making	The information has relevance to a situation and also to a decision making. The irrelevant information is a data
Complete for the decision considerations	The information which covers all the aspects of the decision situation by way of the scope, transactions and period is complete
The timeliness of reporting	The receipt of information on time or when needed is highly useful. The information arriving late, loses its utility as it is outdated

4.2. INFORMATION: A QUALITY PRODUCT

Information is a product of data processing. Even If we take care of the aspects discussed in the above section, the manager will determine the quality of the information based on the degree of motivation it provides for action and the contribution it provides for effective decision-making. The quality of information is high, if, it creates managerial impact leading to attention, decision and action. The quality of information can be measured on the four dimensions, viz, utility, satisfaction error and bias.

Utility: The utility dimension has four facets- the form, the time, the access and the possession. If the information is presented in the form the manager requires then its utility increases. If it is available when needed, the utility is optimized. If the information is easily and quickly accessible through the online access system its utility gets an added boost. Lastly, if the information is possessed by the manager who needs it, then its utility is the highest. Many of the organizations

suffer from the possessive nature of the managers making an access difficult for the other users of the information. Improving the quality through increasing a utility means an increase in the cost. The balance, therefore, is to be maintained between the cost and the utility.

Satisfaction: The common key for measuring the quality could be satisfaction of the decision maker. The degree of satisfaction would determine the quality of the information. IF the organization has a high degree of satisfaction, then one can be safe in saying that the information systems are designed properly to meet the information needs of the managers at all the levels.

Error: An error is the third dimension of the quality of the information. The errors creep in on account of valorous reasons, namely;
- i)   An incorrect data measurement
- ii)   An incorrect collection method
- iii)   Failure to follow the prescribed data processing procedure
- iv)   Loss of data or incomplete data
- v)   Poor application of data validation and control systems
- vi)   A deliberate falsification

An Erroneous information is a serious problem because the decision maker cannot make the adjustments as he is not aware of it in terms of the location and the quantum of error. To control errors, it is necessary to follow the methods of systems analysis and design. The approach should be that the errors should be prevented, failing that they should be detected and if not they should be controlled.

4.3. CLASSIFICATION OF THE INFORMATION:

The information can be classified in a number of ways to provide a better understanding. John Dearden of Harvard University classifies information in the following manner:
- **Action versus No-action information:**

The information which induces action is called an action information. The information which communicates only the status of a situation is a no-action information. No stock report calling a purchase action is an action information but the stock ledger showing the store transactions and the stock balances is a no-action information.

- **Recurring versus Non-recurring information:**

The information generated at regular intervals is recurring information. The monthly sales reports, the stock statements the trial balance, etc. are recurring information. The financial analysis or the report on the market research study is a non recurring information.

- **Internal versus External information:**

The information generated through the internal sources of the organization is termed as internal information, while the information generated through the government reports, the industry surveys, etc. is termed as a external information, as the source of the data are outside the organization. The action information, the recurring information and the internal information are the prime areas for computerization and they contribute qualitatively to the MIS.

- **Planning Information :**

Certain standards, norms and specifications are used in the planning of any activity. Hence, such information is called the planning information. The time standards, the operational standards, the design standards are the examples of the planning information.

- **Control Information:**

Reporting the status of an activity through a feedback mechanism is called the control information. When such information shows a deviation from the goal or the objective, it will induce a decision or an action leading to control.

4.4. METHODS OF DATA AND INFORMATION COLLECTION:

Several methods are available for the collection of data. The choice of methods will have an impact on the quality of information; similarly the design of data collection method also decides the quality of data and information. The methods of data collection and processing become a part of the MIS. Various methods of data collection are explained in the following table 4.2.

Table 4.2. Various methods of data and information collection

Method	Comment	Example
Observation	The first hand knowledge avoids a response bias. An accuracy of observation will decide the response. IT is dependent on the observer and is influenced by the bias	Visit to the customer for assessing the customer complaints. A visit to assess the accidental damage.
Experiment	The information on a specific parameter can be obtained through a control over variables. The quality of information depends on the design of the experiment	Assessing the yield of anew fertilizer by a design of the control experiment. Assessing the market response to a new packaging through test marketing.
Survey	One time. Enables to cover the interested population on specific aspects. The quality of questionnaire will decide the quality of information	Market survey, opinion polls, census.
Subjective estimation	In the absence of all the three above, the expert opinions may be called to collect the information	Data pertaining to future like the alternate source of energy, the life style in the 21st century
Transaction processing	The data exists but needs a processing and an integration for reporting	Ledgers, payroll, stock statements, sales reports
Purchased from outside	Easily available at a price. May be expensive and may have a bias depending on the source	Database on the specific subject, research studies. Market and technology studies
Publications	Low cost but may project or emphasize one view or the other. Information may be lopsided	The government publications, the industry publications, the institutional publications such as NCL, NCRT,BANKS,UNO the

		various public forums.
Government agencies	Available but may not be directly useful not knowing the details of collection analysis and is usually not the latest	The Reserve Bank of India publications. The Tax publications, the reports and findings.

4.5. VALUE OF INFORMATION:

The decision theory suggests that the value of the additional information is the value of the change in the decision behavior resulted by the information, less the cost of obtaining the information. If the additional information does not cause any change in the decision behavior then the value of the additional information is zero. The value of the additional information making the existing information perfect (VPI) is:

$$VPI = (V_2 - V_1) - (C_2 - C_1)$$

Where V is the value of the information and C is the cost of obtaining the information. V_1 and C_1 relate to one set of information and V_2, C_2 relate to the new set. If the VPI is very high, then it is beneficial to serve the additional information need.

In, MIS the concept of the value of information is used to find out the benefit of a perfect information and if the value is significantly high, the system should provide it. If the value is insignificant, it would not be worth collecting and additional information. The decision at the operational and the middle management level are such that the value of the additional or new and tactical in nature, the value of additional information is very high.

4.6. GENERAL MODELS OF A HUMAN AS AN INFORMATION PROCESSOR:

A manager or a decision maker uses his sensory receptors, normally eyes and ears, to pick up information and transmit them to brain for processing and storage. The result of this processing

will be a response which may be a decision, an action or at least recognition of the event for further use. Hence, a manager can be said to be an information processor.

While processing the information for a managerial response, the manager also uses accumulated knowledge from memory. The capacity of a manager to accept and process input to produce output is variable and limited. The limitation arises sometimes on account of the information overload which is external to the manager. This is a case of too much information or extra information creating a problem for the user of the information to sort out the relevant from the irrelevant or the appropriate from the inappropriate. The manager in such a situation adopts the method of filtering the information.

Filtering is a process whereby a manager selectively accepts much inputs, which his mental ability can manage to process. This process blocks the unwanted or the inconsistent data or the data which does not match the frame of reference. The choice of filters may be changed due to stress, urgency of decision-making and the confidence in a particular method of decision making. Many a times a processor is required to perceive, process and evaluate probabilistic information. The processor may be deficient in the intuitive understanding of the information, in the ability to identify the correlation and the casualty and in the capability for integrating the information.

In MIS an experience manager is a skillful information processor here he is able to change the frame of reference or select the decision making tool for the available information. He is also in a position to add more knowledge to the current information to increase the value of the information. A generalized model of information processor is shown in fig 4.2.
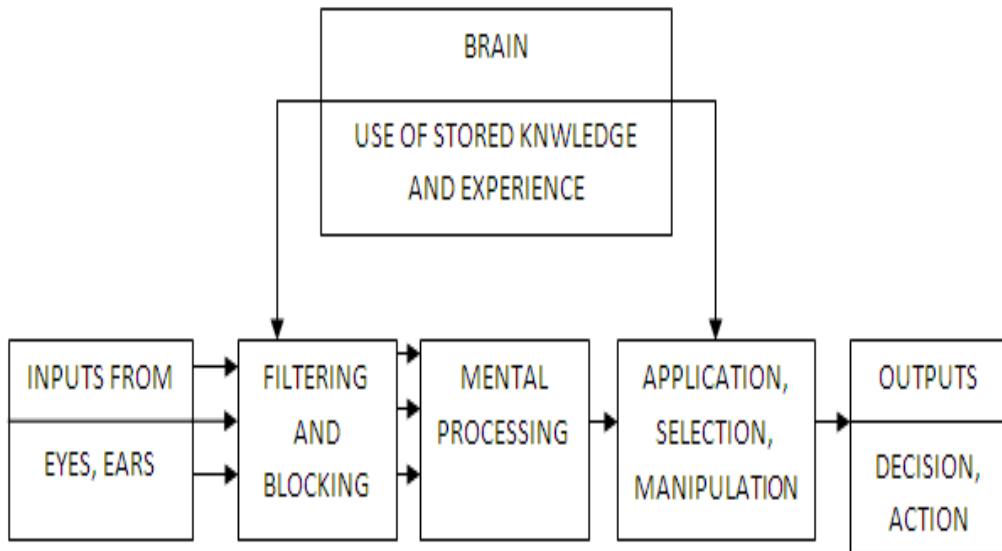
Fig.4.2. Generalized Model of Information Processor

___

4.7. KNOWLEDGE DEVELOPMENT:

___

A collection of information through the library reports and the research studies builds a knowledge base as a source for decision making. Such a collection is not directly connected to decision making, but the need of knowledge is perceived as power or strength of the organization. A organization data warehouse stores are also considered as knowledge. The information can also be classified based on its usage. When the information is used by everybody in the organization, it is called the organization information. When the information has a multiple use and application, it is called the database information. When the information is used in the operations of a business it is called the functional or the operational information.

Knowledge is the ability of a person to predict sense, understand a situation and react to it effectively. Knowledge could be tacit or explicit. Tacit knowledge is difficult to codify, transfer and share while explicitly knowledge is easy to codify, transfer and share. The difference between information and knowledge can be understood better by an example.

i)   Data: Facts and Figures

        Daily Statistics of % rejection of components

ii)   Information: Data with context

    a) % Rejection classified by machine and machining operation

    b) Material used, supplier of the material and linking to % rejection

iii)   Knowledge: Analytical information.

    Information set formed out of different information entities. Putting (a and b together and viewing it as a cause and effect, reveals the knowledge that material supplied by a particular vendor causes more rejections on set of machines.

One can visualize this differentiation in a hierarchy as shown in fig.4.3.
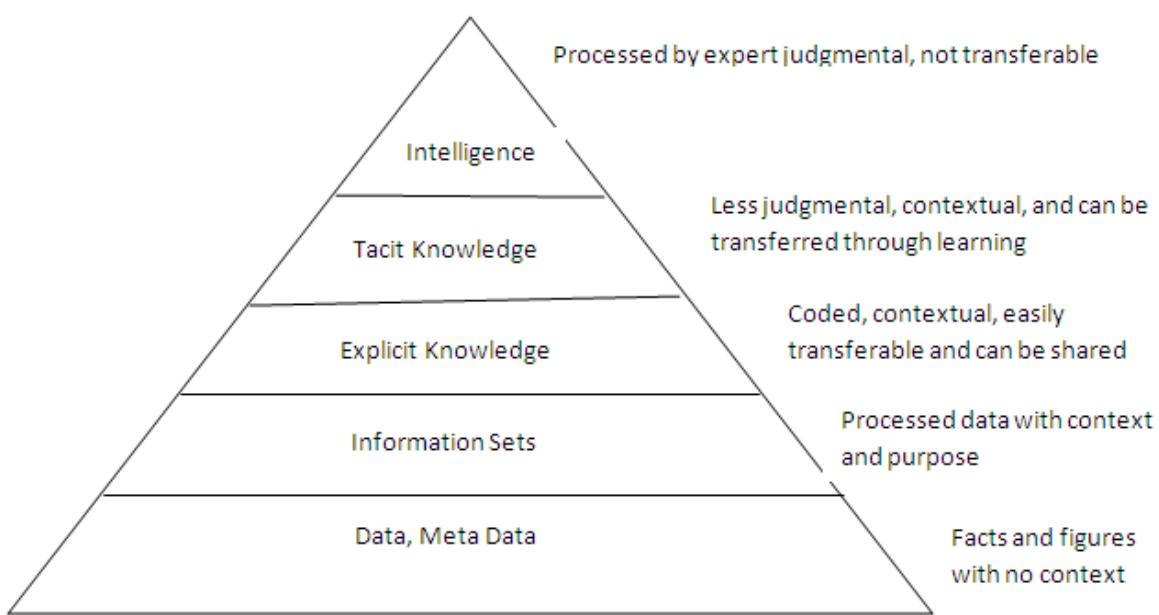
Fig. 4.3. Knowledge Hierarchy

4.8. SUMMARY:

This unit discusses about the basic unit of the management namely data and information. Different types of information and its classifications are also discussed in the subsequent section. Different methods of data collection for information processing are defined to identify it as valued information.

4.9. KEY TERMS:

Internal Information, external information, organization, value of information, Recurring, Non-recurring information, knowledge hierarchy.

4.10. EXERCISE:

1. Explain why information has no specification but it has a character and value.
2. Explain the difference between data processing and information processing.
3. Explain how quality of information improves the knowledge and decision making capability of the people.
4. Explain how knowledge gives a competitive advantage to the organization.
5. Explain the value of information with an example.
6. With a neat diagram explain the conceptual model of communication.
7. List and explain the different attributes of the information with an example to each.
8. Discuss what are the different ways to collect the information.

4.11. REFERENCES:

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.
2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

UNIT -5: DEVELOPMENT OF MANAGEMENT INFORMATION SYSTEMS

Structure

5.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Identify the goals and objectives of the of MIS

- Explain the architecture of MIS

- Discuss different classes of information and its users

- Analyze the requirement of the information

- Explain the approach used in the development and implementation of MIS

- Analyse the management as a quality of information

- Understand MIS as an organization process

_____

5.1. DEVELOPMENT OF LONG RANGE PLANS OF THE MIS:

_____

Introduction

In MIS the information is recognized as a major resource like capital, time and capacity. And if this resource is to be managed well, it calls upon the management to plan for it and control it for the appropriate use in the organization. Most of the organizations do not recognize information as a resource. They have looked at information as one of the many necessities for conducting the business activity. Now a days to handle information in flexible and comfortable manner computers are used as the primary resources to handle information's.

The computers have become user friendly. They can communicate to any distance and share data, information and physical resources of other computers. Computers can now be used as a tool for information processing and communication. It can be used for storing large database or knowledge base. It can be used for knowing the current status of any aspect of the business due to its online real time processing capability. In short we need a management information system flexible enough to deal with the changing information needs of the organization. It should be conceived as an open system continuously interacting with the business environment with a built in mechanism to provide the desired information as per the new requirements of the management.

_____

MIS GOALS AND OBJECTIVES:

It is necessary to develop the goals and objectives for the MIS which will support the business goals. The MIS goals and objectives will consider management philosophy, policy constraints business risks, internal and external environment of the organization and the business.

The goals and objectives of the MIS would be so stated that they can be measured. The typical statements of the goals are as under:

    i)   Provide online information on the stock, markets and the accounts balances.

    ii)   The query processing should not exceed more than three seconds

iii) The focus of the system will be on the end user computing and access facilities.

iv) Information support will be the first in the strategic areas of management such as marketing or service or technology.

Architecture of the MIS

The architecture of the MIS plan provides a system structure and their input, output and linkages. It also provides a way to handle the systems or subsystems by way of simplification, coupling and decoupling of subsystems. It spells out in detail the subsystem from the data entry to processing, analysis to modeling, and storage to printing

The system Development schedule:

A schedule is made for the development of the system. While preparing the schedule due consideration is given to the importance of the system in the overall information requirement. Due regard is also given to logical system development. This development schedule is to be weighed against the time scale for achieving certain information requirement linked to a business plan. If these are not fully met, it is necessary to revise the time schedule and also the development schedule, whenever necessary.

Hardware and Software Plan:

The selection of the architecture, the approach to the information system development and the choice of hardware and software are the strategic decisions in the design and development of the MIS in the organization. The organizations which do not care to take proper decisions in these areas suffer from over investment, under utilization and are not able to meet the critical information requirements.

It is important to not the following points:

i) The organizations strategic plan should be the basis for the MIS strategic Plan.

ii) The information system development schedule should match with the implementation schedule of the business plan.

iii) The choice of information technology is a strategic business decision and not a financial decision.

5.2 ASCERTAINING THE CLASS OF INFORMATION:

Ascertaining the information needs of the management for the business execution is a complex task. The complexity can be handled if the information is classified on the basis of its application and the user, which becomes the basis for the ascertainment. The classification could be as shown in the table 5.1 below.

Table 5.1 Classes of information

Information Class	Example of information	User
Organizational	The number of employees, products, services, locations the type of business, turnover and variety of the details of each one these entities.	Many users at all the levels
Functional Managerial	Purchases, sales, production, stocks, receivables, payables, Outstanding, budgets, statutory information.	Functional heads and others
Knowledge	The trends in sales, production, technology. The deviations from the budgets, targets, norms etc. Competitor's information, industry and business information plan performance and target; and its analysis	Middle and the top management
Decision support	Status information on a particular aspect, such as utilization, profitability standard, requirement versus availability. Information for problem solving and modeling. Quantitative information on the business status. Non. Moving inventory overdue payments and receivables.	Middle management and operations management
Operational	Information on the production, sales, purchase, dispatches consumptions, etc. in the form of planned versus actual. The information for monitoring of execution schedules	Operational and management supervisor section officers

Organizational Information:

It is defined as the information required by a number of personnel, departments and divisions or the functions in the organizations. Such information can be determined by constructing a matrix of information versus users as shown in the table 5.2.

Table 5.2. Matrix of Information versus User for a Personnel Function

Information Entity	Manager (Personnel)	Manager (Production)	Manager (Administration)	Manager (Accounts)
Employees attendance	X	X	X	
Salary wages and overtime	X		X	X
Human resources information	X	X		

Functional Managerial information:

It is defined as a set of information required by the functional head in conducting the administration and management of the function. This information is purely local to the function and by definition does not have a use elsewhere. This information is used by a manager to plan and control the function.

Knowledge:

The knowledge creates an awareness of those aspects of business where the manager is forced to think, decide and act. Such information shows the trend of the activity or a result against the time scale.

Decision support information:

It is defined as the information used in decision support system for model building and problem solving. The support may act in two ways, one for justifying the need of a decision, and the other as an aid to decision making. The decision support information can be determined for the organization at the problem level leavings its use to the decision maker in a suitable manner.

Operational Information:

This information is required by the operational and lower level of the management. The main purpose of this information is fact finding and taking such actions or decisions which will affect

the operations at micro level. The decisions are used for smooth and efficient running of the business.

5.3. DETERMINING THE INFORMATION REQUIREMENT

The sole purpose of the MIS is to produce such information which will reduce uncertainty risk in a give situation. The difficulty to determining correct and complete setoff information is on account of the factors given below.

- The capability constraint of the human being as an information processor a problem solver and a decision maker.
- The nature and the variety of information in précised terms.
- Reluctance of decisions makers to spell out the information for the political and the behavioral reasons.
- The ability of the decisions makers to specify the information.

There are four methods of determining the information requirements. They are:

i) Asking or interviewing
ii) Determining form the existing system
iii) Analyzing the critical success factors
iv) Experimentation and modeling

Asking or Interviewing:

In this method a designer of the MIS puts questions or converses with the user of the information and determines the information requirements. Putting the questions is an art and it should be used properly to seek information. When user has to select one answer from a finite set of answers closed question should be asked. When multiple users or several decision makers in similar functions or positions are involved a brain storming session is performed to coverall possible answers to the questions. Where several users are involved, group consensus can besought to get the most feasible set of answers. The experts or experienced users are asked to give their best answers- this approach is called the Delphi method. In all these methods, the system designer has

to test the validity of all the answers independently. An experienced designed is able to analyze critically the answers given to the questions and determines the correct information requirement.

Determining from the Existing system:

In a number of cases the existing system, which has been evolved after a number of years, and has been designed out of experience gives straightaway the requirement of information. The fund of knowledge is available from the textbooks, handbooks, research studies which can determine the information requirement. Irrespective of the type of organization and business, ninety per cent of the information requirement is common and the balance ten percent may be typical to the organization or the business which needs to be determined separately. The managers in the operations and the middle management use the existing systems as a reference for determining the information requirement. This method is adopted when the rules and decisions methods are outside the perview of the decision maker. They are determined or imposed by external sources such as the government the authority the principles, etc.,

Analyzing the Critical Success factors:

Every business organization performs successfully on efficient management of certain critical success factors .Others factors are important and play a support role in the functioning of the organization. Many times a function is singularly critical to the successful functioning of a business organization.

Experimentation and Modeling:

When there is total uncertainty, the designer and the user of the information resort to this method for determining the information requirement. The experimentation would decide the methodology for handling the complex situation. If the method is finalized, the information needs are determined as they have been evolved through the experimentation. Test marketing of a product is an approach of the experimentation to decide the correct marketing strategy. Sometimes models are used for deciding the initial information needs and they are modified during the implementation stage.

5.4. DEVELOPMENT AND IMPLEMENTATION OF MIS:

Having made the plan of the MIS, the development of the MIS calls for determining the strategy of development. The development strategy determines where to begin and in what sequence the development can take place with the sole objective of assuring the information support. The choice of the system or the subsystem depends on its position in the total MIS plan, the size of the system, the user understanding of the systems and the complexity and its interface with other systems. Determining the position of the system in the MIS is easy. The real problem is the degree of structure, and formalization in the system and procedures which determine the timing and duration of development of the system. Higher the degree of structurdeness and formalization, greater is the stabilization of the rules, the procedures, decision making and the understanding of the overall business activity. The development of the information can be applied in two approaches mainly prototype approach and life cycle approach.

When the system is complex, the development strategy is prototyping of the system. Prototyping is a process of progressively ascertaining the information needs, developing methodology, tying it out on a smaller scale with respect to the data and the complexity, ensuring that it satisfies the needs of the users, and assess the problems of development and implementation. This process identifies the problem areas, in adequacies in the prototype via fulfillment of the information needs In this approach the designer's task becomes difficult, when there are multiple users of the same system and the inputs they users are used by some other users as well. Brining the multiple users on the same platform and changing their attitudes toward information, as a corporate resource, is the managerial task of the system designer.

Life cycle approach:

There are many systems or subsystems in the MIS which have a lifecycle, that is, they have birth and death. Their emergence may sudden or may be a part of the business need, and they are very much structured. And rule based. They have hundred   percent clarity of inputs and their sources a definite set of outputs in term of the contents and formats. Minor changes do occur but they are significant in terms of handling either by the designer or the user of the system. Such

systems, therefore have a life and they can be developed in a systematic manner, and can be reviewed after a year or two, for significant modification, if any. This is defined as shown in the fig. 5.1.
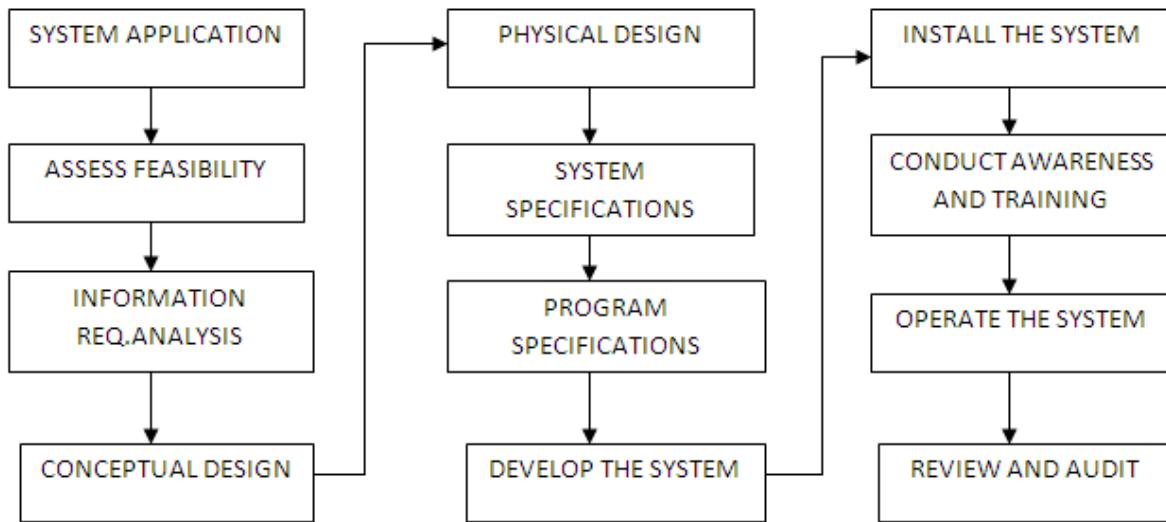
Fig. 5.1. Life cycle Approach to the Development of MIS

Implementation of the Management Information system:

There are certain guidelines for the systems designer for successful implementation of the system. The system designer should:

- Not question beyond a limit the information need of the user.
- Not to forget that his role is to offer a service and not to demand terms.
- System design is for the use of the users and not for the use of the designers. The designer should respect the needs and demands of the users.
- Technical needs should not be mixed up with the information needs.
- Not to challenge the application of the information in decision making.
- Impress upon the user that the quality of information depends on the quality of the input.
- Ensure that the users make commitment to all the requirements.
- Ensure that the overall system effort has the management's acceptance.
- Ensure that the other organization problems are resolved first before the MIS is taken for development.

- Conduct periodical users meetings on systems where you get the opportunity to know the ongoing difficulties of the users.

5.5. MANAGEMENT OF INFORMATION QUALITY IN THE MIS:

Information is a corporate resource, as important as the capital, labor, knows how etc and is being used for decision making. Its quality, therefore, is required to be very high. A low quality information would adversely affect the organizational performance as it affects decision making. The quality of information is the result of the quality of the input data, processing design, system design, system and procedures which generate such a data, and the management of the data processing function. The quality parameters which are generally considered are as shown in the table 5.3. below.

Table 5.3 Quality parameters of Information

Quality of parameter	Example
Complete data of all the transactions	All invoices of the month. All vouchers of the month.
Valid transactions and input data	Only correct transaction types are permitted into the system. Only that data which meet the design specifications can be used
Accuracy and precision	Correct use of the formula or procedure with relevant data.
Relevance to the user/Decision maker	It should be relevant to the user for a decision making strategic areas of business
Timely information	Information on the sales dispatch pending position.
Meaningful and complete information	Production information should be reported in terms of quantity, quality and groups or family and rejection and reasons. It should be given in a proper format with references.

5.6. ORGANIZATION FOR DEVELOPMENT OF MIS:

Proper people organization is basic for the management of any activity or function. The same thing is true for the development of the MIS. The principle of the organization and structuring the organization to the specific needs of the function is a prime necessity of the organization. Hence the organization structure of the MIS would differ from one organization to the other. The type, size and structure of corporate organization become the basis for the MIS organization for handling the MIS function and management alternatives. The major issues involved are

i)   Whether the MIS function should be handled as a centralized or decentralized activity

ii)   The allocation of the hardware and software resources

iii)   The maintenance of the MIS service level at an appropriate level.

iv)   Fitting the organization of the MIS in the corporate organization, its culture and the management philosophy.

5.7. MIS: DEVELOPMENT PROCESS MODEL:

There are many approaches to the development of the MIS model. Each approach has process model which discusses the system design and implementation factors of the systems. Some of the approaches towards the MIS development model and process model is discussed below.

Approach to MIS development model:

- Identify business goals
- Determine critical success factors
- Develop business strategy and is strategies
- Identify critical business applications
- Make decision analysis and enumerate operational and strategic decisions
- Develop business performance indicators
- Identify information entities to decision support for business
- Determine IS structure to generate information to build MIS

- Build MIS superset as prescribed in general Model of MIS

MIS Development Process Model

- MIS development process model.

- Study the business environment

- Study the organization and structure

- Identify mission and business goals

- Identify critical success factors

- Identify critical business applications

- Ascertain the business strategy

- Identify business decisions needed to implement strategy.

- Develop key performance indicators to measure the business progress and performance

- Determine MIS goals supporting business goals

- Link and map MIS and information outcome to business goals and strategy.

5.8. SUMMARY :

This unit provides a brief introduction to the development of long range plans in MIS with its goals, objectives and architectural details involved in building MIS as building blocks. It also discusses about the different classes of information and their acertainity procedure. It also discusses the requirement, development and implementation steps used in the MIS development. The development of MIS through Life cycle model is explained with the process model design and implementation view. It also explains the different methods used in identifying the different requirements of information.

5.9. KEY WORDS:

Goals, objectives, architecture, classes of information, decision support systems, knowledge, organization information, information requirement factors, critical success factors, experimentation, modeling, Life cycle approach, quality parameters, process management.

5.10. EXERCISE:

1. Why is the long range plan of MIS necessary? How is it linked with the business plan of the organization

2. What are the contents of the MIS plan? What is the purpose of the each of them

3. Draw a matrix of the classes of information versus users, and explain the nature of using each case

4. Why should the analyst resort to experimentation for judging the requirement? How is modeling used in this approach?

5. Why would you resort to prototype approach and when would you resort to the life cycle approach in the development of MIS

6. User acceptance and dependence of MIS is a test of a good MIS. How would you ensure that the user related issues are taken care of while designing the system?

5.11. REFERENCES

1. Waman S.Jawadekar ,"Management Information Systems", IVth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

UNIT -6: BUSINESS PROCESS RE-ENGINEERING

_____

Structure

_____

6.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Define Re-engineering of the process
- Identify BPR as a pre-requisite for the process system design
- Identify the relevance of information technology in BPR
- Explain the relation between MIS and BPR
- Realize Value stream model organization
- State the causes of delay in business process

6.1. INTRODUCTION:

Michael Hammer defines re-engineering as the fundamental rethinking and radical redesign of business process to achieve dramatic improvements in the critical contemporary measures of performance such as cost, quality service and speed. The approach to re-engineering aims at customer focus. It requires one to take a different view of the business- the view based on the process and not on the tasks or functions. It requires organization restructuring and redesigning based on the process which terminates at the customer door contributing the value desired by the customer. The fundamental re-thinking, calls for starting all over again rejecting the past. It requires a vision, an innovation and an imagination.

The radical redesign is the second important concept used in the definition of re-engineering. The radical redesign calls for trimming and chopping of this design, so that the cost is reduced, service is improved and the customer gets higher value at a higher speech. The redesign calls for a change in the technology, tools and techniques.

Business re-engineering requires a major change in the mindset. In the present world, business performance is measured in terms of order book, turnover, inventory, payables and receivable, etc. The re-engineering of business calls for a change in the management philosophy. The business strategy should be competitive rather than protective to maintain leadership and growth. It should be such that it keeps the organization under a constant state of alert. Re-engineering also calls for a change in the performance measures. The traditional performance measures, viz., the cost, quality, productivity, efficiency, overheads and many others are useful but would not be relevant to the coming decades.

6.2 BUSINESS PROCESS:

The business process is defined as a set of activities performed across the organization creating an output of value to the customer. Every process has customer who may be internal or external to the organization. The scope of the process runs across the departments and functions and end

up in substantial value addition which can be measured against the value expectation of a customer.

For example the order processing scope in the traditional sense within the marketing department. But when it comes to re-engineering the scope expands to manufacturing, storing, delivering and recovering the money.

Basic element of business process is:

- Motivation to perform
- Data gathering, processing and storing
- Information processing
- Checking, validating and control
- Decision making
- Communication

These steps are performed a number of times across the execution process. When the process is performed it consumes resources and time. The re-engineering approach attempts to eliminate or shorten the steps so that resource consumption is reduced and time of process execution is shortened. It eliminates redundancy by eliminating there steps which do not contribute to the value customer is looking for.

A business process defined for re-engineering has a clear cut start and end, producing a business result. In organization there are long processes and short processes. There are critical processes and not so critical processes. The critical business processes are those which contribute to the value significantly. While the non critical processes do not contribute much to the value the customer is looking for.

6.3. PROCESS MODEL OF THE ORGANIZATION:

The process model of the organization for BPR considers only those processes where the end of each process produces a result where by the customer concern, interest, expectation and perception are affected. It considers only those processes which produce value for the customer. For constructing the process model, the processes which are essential for the smooth working of the business such as the employee related processes, audit, budgeting and accounting, security,

general administration etc., are not considered. Such process contributes to substantial overheads and cold be so considered for cost control in second phase.

The need for constructing a process model of the organization is to force some fundamental rethinking, and redesigning that will bring a dramatic change in the working and the end result of the organization. It will not permit thinking on the task basis within the confines of the function of department. Every activity in the process will be evaluated from the stand point of an ultimate result. It will help to redesign the process in terms of input, process and effectiveness and productivity.

6.4. VALUE STREAM MODEL OF THE ORGANIZATION:

The organization is established to fulfill customer needs, having associated customer values. The value is a measure, an intangible measure, which is difficult to count in clear terms or specific actions as different customers have different value priorities, value mix and busying decision criteria. However, if the value expectations are fulfilled, the customer satisfaction is automatic. Depending upon the value choice of the customer, the processes of the organization become critical and relevant. Only the critical processes really matter for business success in terms of survival, growth, leadership and competitive advantage. All organizations have some processes which are critical from value view point.

Once the process model and the value stream model is built, the process organization can be implemented. In the process execution, people come together to form a work group. The work group, as a team, executes a complete process cycle. To improve the performance of the team a number of measures are used. On the technology front the team uses information technology extensively. It facilitates freeing data from ownership. It is put into database which is designed independent of its applications or use. The access is free to all concerned but at the same time it is secured properly to prevent unauthorized access to the information.

6.5 WHAT DELAYS THE BUSINESS PROCESS:

A business process is complex and lengthy, and if conventionally designed and implemented on functional lines, a number of processing steps are repeated across. The process operators repeatedly search, access, refers, compute, and analyze the some data or a set of the data in different contexts across the process for achieving the local objectives of the department or function. This increases the process cycle time.

The information technology capabilities can be put to use while redesigning the process so that such repetition is eliminated and all the decisions covering all aspects of the business are settled in one stroke, saving the process time considerable. The numbers of steps in any business process related to the data search, its matching, collating, validating, confirming and conforming and conforming are carried out only once in the redesigned process with the help of information technology.

Through this process, a typical business transaction is settled for acceptance, fulfilling various other needs outside that process in the organization. For example, the receipt of goods, transaction when processed with the information technology application, settles a number of aspects of this one a transaction. The aspects are whether:

(a) the receipt is against the valid purchase order,
(b) goods received are as per specifications both in terms of quality and quantity,
(c) the terms and conditions of supplies are fully met,
(d) the value declarations are correct and complete, and
(e) amount payable is computed and kept ready for confirmation through the bill of the supplier

Since all such aspects with the carnations are settled at one place in one stroke, the dependent steps in the rest of the business functions are expedited reducing the total process cycle time.

The modern information technology provides intelligent capabilities to incorporate business rules in the application system, whereby the decision making at all levels can be rationalized,

normalized and expedited. Though using these capabilities, the information technology uses its own data and knowledge bases for decision making.

In the conventional functional processing, a transaction awaits for scrutiny analysis and approval by the decision maker. If all methods of scrutiny, analysis, approval, and decision making are put in the redesigned process using information technology capabilities the time taken in the transaction and processing is saved.

The delays arising out of queuing and hold- up, due to the absence of the decision maker. The time taken for signatures and counter signatures, filling and updating the records, and communication to all the concerned agencies are saved reducing the process cycle time.

IT capability of triggering the action of certain condition framed by the management in terms of the policies, rule, formula and procedure are satisfied. IT is a capability of analyzing the situation created by a business transaction and further interpreting the transaction results in terms of the policy and rules and then triggering action at various points.

The information technology is capable of handling progressive updating and documentation of a transaction. It can handle first the receipt of goods, then in warding, and the acceptance followed by inspection. At each stage, no separate document is generated. The IT provides the capability of updating a receipt transaction in stages with the appropriate comments or remarks. This saves paper flow and delay due to non- attendance of documents.

The issues revolving around secrecy, confidentiality and safety of the data and information can also be handled effectively using IT. In the conventional approaches of processing, such data is kept under the custody of the senior people in the organization and its availability is person – dependent. The IT provides the capability of handling this aspect of information whereby the access , usage , and update rights can be given to selected trained people and the system keeps an account of its use in all aspects- who ,when why and from which location. The use of this capability reduces bureaucratic dependence on the senior person in the hierarchy or the authority reducing the processing time.

The modern IT provides very powerful communication facilities with no limitation of distance. The hardware and software heterogeneity does not pose any problems. Communication

is possible to handle without regard to the distance. Video conferencing, multimedia processing, electronic data interchange and E-mail has made it possible to process any input at any location and transfer the output in any medium to the other location.

In functional approach, when the business process is complex due to the business rules and methodology, it is handled by breaking the process in a series of smaller tasks and connecting them by information linkage or decoupling them by providing the data information in the stored form.

The storage capacity has no limitation and the hardware-software capability is no problem in IT. It is possible to distribute appropriate information technology facilities at different locations and connect them in network. With these facilities the database can be distributed at the different locations and still can be viewed and used as one database. The facilities are capable of handling private and public database to provide information to the decision makers.

The working of organization made seamless and transparent to all by the information technology and its working can be changed keeping in view the supplier and the customer needs. The processing can be redesigned in such a way that the system in the organization and that of the supplier or the customer can communicate directly to each other.

The hierarchy in the organization reduced eliminating the bureaucratic interference, at each stage in the redesigned process the functional tools, knowledge, know-how, and skills are provided. Each process stage is complete and self reliant.

In the conventional process design, the process operators acted as individual in isolation creating barriers in movement of papers and information. The capabilities of the information technology enable the organization to redesign the processes for a team of persons working for a common goal and customer satisfaction. Since, the redesigned process with IT support will be response driven; it is possible for the team leader or manager acting as a facilitator to take quick action.

The information technology needs intelligent handling and application for redesigning the process. The capability of the information technology is phenomenally higher and assures dramatic results in the cost, time, service and delivery. It increases the people productivity and

process effectiveness. The information therefore is a very strong potential enabler in the business process re-engineering.

6.6. RELEVANCE OF INFORMATION TECHNOLOGY (IT):

It is experienced that the role of the IT as an enabler is very important and significant in re-engineering .its contribution compare to the other technologies to the radical redesigning of the process is maximum. The range of technologies in all fields based on the microprocessor applications affect a number of factors of the business process. Any business process in the course of execution gathers and processes the data and stores it for further use.

The business process requires a formation and its analysis for decision-making. In the course of execution, it checks, validates and controls a number of aspects of the business process before taking the decision for implementation. The search capabilities of the IT are so versatile that an unknown entity can be searched with a limited or a hazy clue. Since, the speed is very high , such search is handled with the quick access capabilities.

Similarly, IT provides storage capabilities in a number of ways. There are different media to store the data and information. The storage of the data can be structured around the hardware and software. It is possible to store data in distributed order in different locations and still be one database whole organization sharable by all. It is possible to process the data at one location and affect the update at other different locations.

 The data can be on-line data or an off-line data as the need be. The capacity of the storage medium is very high. Day by day storage medium is becoming smaller in size but at the same time its data holding capacity is increasing. The capacity of the IT for data capture, speedy processing and storage and communication to any locations helps to build the knowledge database. The knowledge database can be used for decision making by all. If any business process is analyzed it has two parts- one physical process such as movement and handling of paper and goods, and other related To the processing of the data, information and decision

making . The first part of the process identifies, search, locates, pick up and then moves the paper or goods to the next stage for further processing. The IT provides work flow automation software , Bar coding technology, and intelligent handling systems using microprocessor based technology to handle the physical side of the business process.

The process on the shop floor and warehouse can use the IT effectively to expedite all the steps of movement, handling, shifting, picking, locating, relocating and distribution of the goods. The second major component in the business process is data analysis and decision making to trigger a suitable action .once the action is complete in the process , the necessary document would be generated and records at various location be updated for further reference. The IT provides different capabilities to deal with these requirements of the business process the physical processes and the data handling processes go hand in hand. They are complementary and supportive to each other.

Since, each business process is to be redesigned for dramatic improvements. Its key areas of attack are time and resource used by the processor. Our goal in re-engineering is to save the process time considerably and use minimum direct and indirect resources. The relevance of IT is appropriate due to its merit as the catalyst and the process partner for improvement.

The speed and response of the basic steps such as searching, access, computing, analyzing, transferring and communicating, printing, plotting etc. are improved by IT. The use of IT enables the re-engineering of the value stream process to be an expedition process. The IT is an enabler and information systems are tools and the decision support system are drivers for the process performance are engineering value stream process will generate the transactions to effect the business result. The management information system will capture the data on the various milestones in the process and create the MIS report for management at all levels.

6.7. MIS and BPR:

An exercise towards building designers of the management information system will be preceded by an exercise of business process re-engineering .building the MIS is a long-term project. It is

therefore, essential to have a relook at the organization where the mission and goals of the organization are likely to be replaced. The MIS will concentrate more on the performance parameter evaluation which is different in the re-engineered organization. The data capture, processing, analysis and reporting would be process central performance efficiency would be evaluated in relation to the value generated by the processes. The decision support system will be integrated in the business process itself, where triggers are used to move the process. The triggers could be business rules and stored procedures, enabling the process to become automotive in its execution. The MIS in the re-engineered organization would be more of a performance monitoring tool to start with and then a control for the performance. The management information system in a re-engineered or organization would be process centered, evaluating customer satisfaction, expectation and perceptions. The role of management information system will be raised to a level where the following activities would be viewed for the management action:

- Control of process cycle time
- Work group efficiency
- Customer satisfaction index
- Process efficiency and effectiveness
- Effectiveness of the management in enterprise management and not in enterprise resources
- The strength of the organization in terms of knowledge, learning and strategic effectiveness

6.8. SUMMARY:

This unit provides the detail insight about the re-engineering concepts used for process management. It provides the information viewing the business process as an organization system, value stream model of the organization discussing the important factors of information that are treated as a value. This unit also pointsout the concept that delays the business process in the organization. The relevance of information to the Information Technology field in terms of re-engineering the entities, systems, processes, responses, supplies etc., are discussed at various

levels. Lastly, the relation between the MIS and business process re-engineering is discussed in brief.

6.9. KEY WORDS:

Business process, re-thinking, redesign, traditional performance measures, management actions, decision making, transaction processing, re-engineering, MIS.

6.10. EXERCISE:

1. What is BPR? Why is it required? Who needs it and who does not?
2. What is the role of IT in BPR?
3. A good implementation of IT means business process is re-engineered, is it true?
4. Which are the other technologies which are also the enablers of the BPR?
5. Which approach succeeds in BPR launch, top down or bottom up.

6.11. REFERENCES:

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.
2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

UNIT -7: DECISION MAKING

_____

Structure

7.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Understand the Characteristics of the Business decisions
- Understand about the Herbert Simon model of Decision making
- Identify Types of Decision
- Understand the Evaluation and Selection of Decision Alternatives
- Identify Four ways of decision analysis
- Understand Behavioral concepts and Decision making

7.1. INTRODUCTION:

Decision making can be regarded as the mental processes (cognitive process) resulting in the selection of a course of action among several alternative scenarios. Every decision making process produces a final choice. The output can be an action or an opinion of choice.

7.1.1. DECISION MAKING CONCEPTS:

The word decision is derived from the Latin root decido, meaning to cut off. The concept of decision, therefore, is settlement, a fixed intention bringing to a conclusive result, a judgment, and a resolution. A decision is the choice out of several options made by the decision maker to achieve some objective in a given situation. Business decisions are those, which are made in the process of conducting business to achieve its objectives in a given environment. In concept, whether we are talking about business decisions or any other decision, we assume that the decision maker is a rational person who would decide, with due regard to the rationality in decision making. The major characteristics of the business decision making are:

(a) Sequential in nature

(b) Exceedingly complex due to risks and tradeoffs.

(c) Influenced by personal vales

(d) Made in institutional settings and business environment.

The decision making process is a complex process in the higher hierarchy of management. The complexity is the result of many factors, such as the inter-relationship among the experts or decision makers, a job responsibility, a question of feasibility, the codes of morals and ethics, and a probable impact on business. The personal values of the decision maker play a major role in decision making. The culture, the discipline and the individual's commitment to the goals will decide the process and success of the decision.

The major characteristics of the business decision making are:

(a) Sequential in nature.

(b) Exceedingly complex due to risks and tradeoffs.

(c) Influenced by personal vales

(d) Made in institutional settings and business environment.

The business decision making is sequential in nature. In business, the decisions are not isolated events. Each of them has a relation to some other decision or situation. The decision may appear as a snap decision but it is made only after a long chain of developments and a series of related earlier decision.

The decision making process is a complex process in the higher hierarchy of management. The complexity is the result of many factors, such as the inter-relationship among the experts or decision makers, a job responsibility, a question of feasibility, the codes of morals and ethics, and a probable impact on business. The personal values of the decision maker play a major role in decision making. A decision otherwise being very sound on the business principle and economic rationality may be rejected on the basis of the personal values, which are defeated if such a decision is implemented. The culture, the discipline and the individual's commitment to the goals will decide the process and success of the decision.

Whatever may be the situation, if one analyses the factors underlying the decision making process, it would be observed that there are common characteristics in each of them. There is a definite method of arriving at a decision: and it can be put in the form of decision process model. The decision making process requires creativity, imagination and a deep understanding of human Behavior. The process covers a number of tangible and intangible factors affecting the decision process. It also requires a foresight to predict the post-decision implications and a willingness to face those implications. All decisions solve a problem but over a period of time they give rise to a number of other problems.

7.2. DECISION MAKING PROCESS:

Decision making is a process which the decision maker uses to arrive at a decision. The core of this process is described by Herbert Simon in a model. He describes the model in three phases as shown in Fig. 7.1 viz.: (a) Intelligence; (b) Design; and (c) Choice. MIS follows this model in its

development state.
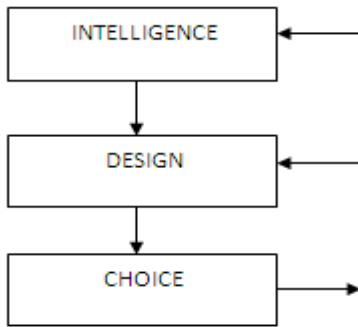
Fig. 7.1 Herbert Simon Model

Intelligence

Raw data collected, processed and examined. Identifies a problem calling for a decision.

Design

Inventing, developing and analyzing the different decision alternatives and testing the feasibility of implementation. Assess the value of the decision outcome.

Choice

Select one alternative as a decision, based on the selection criteria.

In the intelligence phase, the MIS collects the data. The data is scanned, examined, checked and edited. Further, the data is sorted and merged with other data and computations are made, summarized and presented. In this process, the attention of the manager is drawn to all the problem situations by highlighting the significant differences between the actual and the expected, the budgeted or the targeted. In the design phase, the manager develops a model of the problem situation on which he can generate and test the different decisions to facilitate its implementation. If the model developed is useful in generating the decision alternatives, then the further moves into phase of selection called as choice. In the phase of choice, the manager evolves a selection criterion such as maximum profit, least cost, minimum waste, least time taken, and highest utility. The criterion is applied to the various decision alternatives and the one which satisfies the most is selected. In these three phases, if the manager fails to reach a decision, he starts the process all over again from the intelligence phase where additional data and information is collected, the decision making model is refined, the selection criteria is changed

and a decision is arrived at. The MIS achieves this in an efficient manner without repeated use of the Simon Model again and again. An ideal MIS is supposed to make a decision for the manager.

7.2.1.Decision Making Systems

The decision making systems can be classified in a number of ways. There are two types of systems based on the manager's knowledge about the environment. If the manager operates in a known environment then it is a closed decision making system. The conditions of the closed decision making system are:

(a) The manager has a known set of decision alternatives and knows their outcomes fully in terms of value, if implemented.

(b) The manager has a model, a method or a rule whereby the decision alternatives can be generated, tested, and ranked.

(c) The manager can choose one of them, based on some goal or objective.

A few examples are a product mix problem, an examination system to declare pass or fail, or an acceptance of the fixed deposits.

If the manager operates in an environment not known to him, then the decision making system is termed as an open decision making system. The conditions of this system are:

(a) The manager does not know all the decision alternatives.

(b) The outcome of the decision is also not known fully. The knowledge of the outcome may be a probabilistic one.

(c) No method, rule or model is available to study and finalize one decision among the set of decision alternatives.

(d) It is difficult to decide an objective or a goal and, therefore, the manager resorts to that decision, where his aspirations or desires are met best.

Deciding on the possible product diversification lines, the pricing of a new product, and the plant location, are some decision making situations which fall in the category of the open decision making systems. The MIS tries to convert every open system to a closed decision making system by providing information support for the best decision. The MIS gives the information support,

whereby the manager knows more and more about the environment and the outcomes, he is able to generate the decision alternatives, test them and select one of them. A good MIS achieves this.

7.3. DECISION MAKING BY ANALYTICAL MODELLING:

The main advantage of decision-analytic modeling is that data from different sources can be synthesized. Especially in an early stage of organizational innovation little evidence is available, and the limited evidence is often found in different sources. This uncertainty can be incorporated in the model by assigning distributions to the model parameters. Incorporating uncertainty also makes results easier to interpret by decision makers, as one can calculate which format has the highest probability of being cost-effective. Rational decision making is the most widely used analytical modeling method used in MIS. This method is detailed explained as follows.

Rational Decision Making

A rational decision is the one which, effectively and efficiently, ensures the achievement of the goal for which the decision is made. If it is raining, it is rational to look for a cover so that you do not get wet. If you are in business and want to make profit, then you must produce goods and sell them at a price higher than the cost of production. In reality, there is no right or wrong decision but a rational or an irrational decision. The quality of decision making is to be judged on the rationality and not necessarily on the result it produces.

The rationality of the decision made is not the same in every situation. It will vary with the organization, the situation and the individuals view of the business situation. The rationality, therefore, is a multi-dimensional concept. For example, the business decisions in a private organization and a Public Sector Undertaking differ under the head of rationality. The reason for this difference in rationality is the different objectives of the decision makers. Any business decision if asked to be reviewed by a share-holder, a consumer, an employee, a supplier and a social scientist, will result in a different criticism with reference to their individual rationality. This is because each one of them will view the situation in different contexts and the motive with the different objectives. Hence, whether a decision is right or wrong depends on a specific rational view.

The question which further arises: Is a decision rationales? If it turns out to be wrong in terms of the results it produces, can we cast doubts on the rationality? Simon Herbert A* differentiates among the types of rationality. A decision, in a given situation is:

- Objectively rational if it maximizes the value of the objective.
- Subjectively rational if it maximizes the attainment of value in relation to the knowledge and awareness of the subject.
- Herbert Simon A, Top Management Planning, The Macmillan Company by George A Steiner.
- Consciously rational to the extent the process of the decision making is a conscious one.
- Organizationally rational to the degree of the orientation towards the organization.
- Personally rational to the extent it achievers an individuals personal goals.

In other words, so long as the decision maker can explain with logic and reason, the objectivity and the circumstances in which the decision is made, it can be termed as a rational decision. Whether the rationality applied is appropriate or not could be a point for debate. Gross Bertram M* suggests three dimensions of rationality. First, the degree of satisfaction of human interest. Second, the degree of feasibility in achieving the objectives. Third, a consistency in decision making. If a decision maker shows a consistent behavior in the process of decision making, then one can say that he meets the test of the rationality.

The Problems in Making Rational Decisions

(a) Ascertaining the problem

As Peter Drucker points out, .the most common source of mistakes in the management decisions is the emphasis on finding the right answers rather than the right questions.. The main task is to define the right problem in clear terms. The management may define the problem as the .Sales are declining.. Actually, the decline of sales is symptomatic; the real problem may be somewhere else. For example the problem may be the poor quality of the product and you may be thanking of improving the quality of advertising.

(b) Insufficient knowledge

For perfect rationality, total information leading to complete knowledge is necessary. An important function of a manager is to determine whether the dividing line is reached between insufficient knowledge and the enough information to make a decision.

(c) Not enough time to be rational

The decision maker is under pressure to make decisions. If time is limited, he may make a hasty decision which may not satisfy the test of rationality of the decision.

(d) The environment may not cooperate

Sometimes, the timing of the decision is such that one is forced to make a decision but the environment is not conducive for it. The decision may fail the test of rationality as the environmental factors considered in the decision-making turn out to be untrue. For example, in a product pricing, the factor of oil and petroleum product price is considered as stable. But the post decision environment proves the consideration to be wrong.

(e) Other limitations

Other limitations are the need for a compromise among the different positions, misjudging the motives and values of people, poor communications, misappraisal of uncertainties and risks, an inability of a human mind to handle the available knowledge and human behavior.

How do we then ensure rationality? It is ensured, if the process of decision making is carried out systematically, whereby all the aspects of the decision making discussed above are taken care of. Herbert Simon said that a decision maker follows the process of decision making disregarding the decision or the type of decision and the motive behind the decision. This process is followed consciously or without knowing it. We can put this process in the Decision Making Model.

_____

7.4. BEHAVIOURAL CONCEPTS IN DECISION MAKING:

_____

A manager, being a human being, behaves in a peculiar way in a given situation. The response of one manager may not be the same as that of the two other managers, as they differ on the behavioral platform. Even thought tools, methods and procedures are evolved, the decision is

many a times influenced by personal factors such as behavior. The manager differ in their approach towards decision making in the organization, and, therefore, they can be classified into two categories, viz., the achievement-oriented, i.e., looking for excellence and the task-oriented, i.e., looking for the completion of the task some-how. The achievement-oriented manager will always opt for the best and, therefore, will be enterprising in every aspect of the decision making.

The managers personal values will definitely influence ultimately. Some of the managers show a nature of risk avoidance. Their behavior shows a distinct pattern indicating a conservative approach to decision making a path of low risk or no risk. Further, even thought decision making tools are available, the choice of the tools may differ depending on the motives of the manager. The motives are not apparent, and hence, are difficult to understand. A rational decision in the normal course may turn out to be different on account of the motives of the manager. The behaviors of the manager are also influenced by the position he holds in the organization. The behaviors are influenced by a fear and an anxiety that the personal image may be tarnished and the career prospects in the organization may be spoiled due to defeat or a failure. The managerial behavior, therefore, is a complex mix of the personal values, the atmosphere in the organization, the motives and the motivation, and the resistance to change. Such a behavior sometimes overrides normal rational decisions based on business and economic principles.

7.5. ORGANISATIONAL DECISION MAKING:

An organization is an arrangement of individuals having different goals. Each individual enjoys different powers and rights because of his position, function and importance in the organization. Since there is an imbalance in the power structure, the different individuals cannot equally influence the organizational behavior, the management process and the setting of business goals. Ultimately, what emerges is a hierarchy of goals which may be conflicting, self defeating and inconsistent. The corporate goals and the goals of the departments/divisions or the functional goals, may a time, are in conflict. If the organization is a system, and its departments / divisions or functions are its subsystems, then unless the systems objective and the subsystems objectives are aligned and consistent to each other, the corporate goals are not achieved. In case of

inconsistent goals, the conflict in the organization increases, affecting the organizations overall performance. The organizational decision making should help in the resolution of such conflicts. Otherwise, the organization suffers from indecision. The organizational behavior theory provides different methods for resolution of avoiding such conflicting goals as explained in Table 7.1

Table 7.1 Methods of Conflict Resolution

Method	Explanation	Example
Allowing local rationality in the setting of goals	Where the functional interdependence is minimum and the goals/objectives/targets do not significantly influence the corporate goals	Security, Time, Office functions, Legal, Commercial, Administrative functions
Permission to set goals which can be achieved with an acceptable decision making rule and systems	Where there is functional dependence, to set local goals which will not adversely affect the goals of dependent functions	Production versus sales versus materials functions can evolve decision rules to meet the local goals and affect the goals of the dependent functions, or the corporate goals.
Permission to achieve the goals in a sequential manner	If the goals are conflicting, they are resolved in a sequential manner one at a time. It is a deliberate decision to ignore the conflicting goals within a bounded rationality.	Maximization of profit, quality, level, customer satisfaction, leadership image etc.

7.6. DECISION MAKING AND DSS:

7.6.1. Decision Making

The decision making is related to the type of decision making**.** The types of decisions are based on the degree of knowledge about the outcomes or the events yet to take place. If the manager

has full and precise knowledge of the event or outcome which is to occur, then his problem of the decision making is not a problem. If the manager has full knowledge, then it is a situation of certainty. If he has partial knowledge or a probabilistic knowledge, then it is decision making under risk. If the manager does not have any knowledge whatsoever, then it is decision making under uncertainty.

A good MIS tries to convert a decision making situation under uncertainty to the situation under risk and further to certainty. Decision making in the operations management, is a situation of certainty. This is mainly because the manager in this field has fairly good knowledge about the events which are to take place, has full knowledge of environment, and has predetermined decision alternatives for choice or for selection.

Decision making at the middle management level is of the risk type. This is because of the difficulty in forecasting an event with hundred per cent accuracy and the limited scope of generating the decision alternatives.

At the top management level, it is a situation of total uncertainty of account of insufficient knowledge of the external environment and the difficulty in forecasting business growth on a long-term basis. A good MIS design gives adequate support to all the three levees of management.

Nature of Decision

Decision making is a complex situation. To resolve the complexity, the decisions are classified as programmed and non-programmed decisions. If a decision can be based on a rule, method or even guidelines, it is called the programmed decision. If the stock level of an item is 200 numbers, then the decision to raise a purchase requisition for 400 numbers is a programmed-decision-making situation. The decision maker here is told to make a decision based on the instructions or on the rule of ordering a quantity of 400 items when its stock level reaches 200.

If such rules can be developed wherever possible, then the MIS itself can be designed to make a decision and even execute. The system in such cases plays the role of a decision maker based on a given rule or a method. Since the programmed decision is made through MIS, the effectiveness of the rule can be analyzed and the rule can be revived and modified from time to time for an

improvement. The programmed decision making can be delegated to a lower level in the management cadre.

A decision which cannot be made by using a rule or a model is the non-programmed decision. Such decisions are infrequent but the stakes are usually larger. Therefore, they cannot be delegated to the lower level. The MIS in the non-programmed-decision situation can help to some extent, in identifying the problem, giving the relevant information to handle the specific decision making situation. The MIS, in other words, can develop decision support systems in the nonprogrammed- decision-making situations.

Methods for Deciding Decision Alternatives There are several methods to help the manager decide among the alternatives. The methods basically are search processes to select the best alternative upon satisfying certain goals. Three methods for selection of decision alternatives with the goals in view are: (a) Optimization Techniques; (b) Payoff Analysis; and (c) Decision Tree Analysis. All the operational research models use optimization techniques, to decide on the decision alternatives. When a decision making situation can be expressed, in terms of decision versus the probable event, and its pay-off value, then it is possible to construct a matrix of the decision versus the events described by a value for each combination. The manager can then apply the criteria such as the maximum expected value, the maximum profit and the minimum loss or the minimum regrets. The method of decision tree can be adopted, if the decision making situation can be described as a chain of decisions. The process of the decision making is sequential and a chain of decisions achieves the end regrets. The use of both pay-off matrix and the decision tree requires a probabilistic knowledge of the occurrence of events. In many situations this knowledge is not available and the MIS has to provide the information support in this endeavor.

7.6.1.2. MIS AND DECISION MAKING CONCEPTS

The MIS and its organizational subsystems contribute to decision making process in many basic ways. Nowadays, some of the organizations use MIS to assist managers for decision making. Historically, the MIS was a manual process used to gather information and funnel it to individuals responsible for making decisions.

- *Organization–wide information resource*

The MIS is an organization – wide effort to provide decision making process information. The system is a formal commitment by executive to make the computer available to all managers. The MIS sets the stage for accomplishments in the other area, which is DSS, the virtual office and knowledge based systems.

- *Situation analysis, problem identification and understanding*

The main idea behind the MIS is to keep a continuous supply of information flowing to the management.

Afterward by data and information gathered from MIS system, make decisions.

7.6.2. DECISION SUPPORT SYSTEM (DSS):

A **decision support system** (**DSS**) is a human based or computer-based information system that supports business or organizational decision-making activities. DSSs serve the management, operations, and planning levels of an organization and help to make decisions, which may be rapidly changing and not easily specified in advance. DSS include knowledge-based systems. A properly designed DSS is an interactive software-based system intended to help decision makers compile useful information from a combination of raw data, documents, and personal knowledge, or business models to identify and solve problems and make decisions.

Alternatively the decision support system or DSS is a computer based system intended for use by a particular manager or usually a group of managers at any organizational level in making a decision in the process of solving a semi structured decision (Figure 7.1). The DSS produces output in the form of periodic or special report or the results of mathematical simulations. It is difficult to pinpoint that are completely structured or unstructured. The vast majorities are semi structured. This means that the DSS is aimed at the area where most semi structured decision is needed to be made.
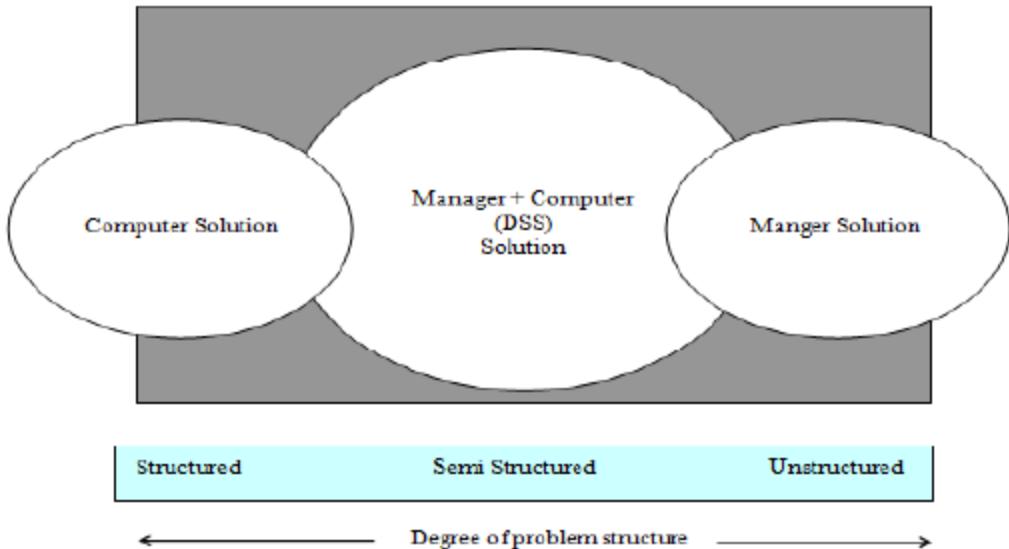
Figure 7.1. The DSS focuses on semi structured problems

7.6.2.1 DECISION SUPPORT SYSTEM (DSS) CONCEPT AND PHILOSOPHY:

Decision Support Systems are an application of Herbert Simon Model. As explained earlier, the model has three phases, viz. Intelligence, Design and Choice. The decision support system basically helps the information system in the intelligence phase where the objective is to identify the problem and then go to the design phase for solution. The choice of selection criterion varies from problem to problem. It is therefore, required to go through these phases again and again till a satisfactory solution is found. In the following three phase cycle, you may use inquiry, analysis, and models or accounting system to come to a rational solution. These systems are helpful where the decision maker calls for complex manipulation of data and use of several methods to reach an acceptable solution using different analysis approach. The decision support system helps in making a decision and also in its performance evaluation. These systems can be used to validate the decision by performing sensitivity analysis on various parameter of the problem. In decision making, we know that there are two types of decisions- Programmable and Non-programmable. The programmable decision, because of its rule base structure, can be computerized, as inputs, processing methodology; analysis and choice of decision making are predetermined. Decision support system can be built around the rule in case of programmable decision situation. While in Nonprogrammable decisions, the rule are not fixed or predetermined,

and requires every time the user to go through the decision making cycle as indicated in the Herbert Simon Model.

The decision support refers to a class of systems which support in the process of decision making and does not always give a decision itself. The nature of the decision is such that the decision makers need a variety of information, when same or similar types of decisions are to be made. These needs are such that wider additional demands on information would be made, the moment a piece of information is received. The calls on the information are continuously made till the decision maker is fully satisfied. The reason for changing the demands is also because the methods of decision making undergo a change from time to time. The quantum and the scope of Information also changes depending upon the risk in decision making. The higher the risk, more the information sought.

7.6.2.2.A DSS MODEL:

A DSS model includes four parts as shown in figure 7.2.

- **Data base** produces both internal and environmental data, which are stored in the database.

- **Report writing software** produces both periodic and special reports. Periodical reports are prepared according to a schedule and typically they are produced by software, which is coded in a procedural language such as COBOL or PL/I. The special report is prepared in response to unanticipated information need and takes form of database by users who use the query language of a DBMS or fourth generation language.

- **Mathematical model** produces information as a result of either simulation that involves one or more components of the physical system of the firm or facts of its operations. Mathematical models can be written in any procedural programming language. However, special model languages make this task easier and have the potential of doing a better job.

- **Groupware** enables multiple decision makers, working together as a group, to reach solutions. In this particular situation, the term GDSS, or a group decision support system is used. Perhaps the decision makers represent a committee or a project team. The group members communicate with one another both, directly and by means of the group ware. The reports writing software and mathematical model have always been regarded as necessary DSS ingredients.

As the DSS concept was broadened to provide support to two or more decision maker working together as a team or committee, the idea of special group oriented software or groupware, became a reality.
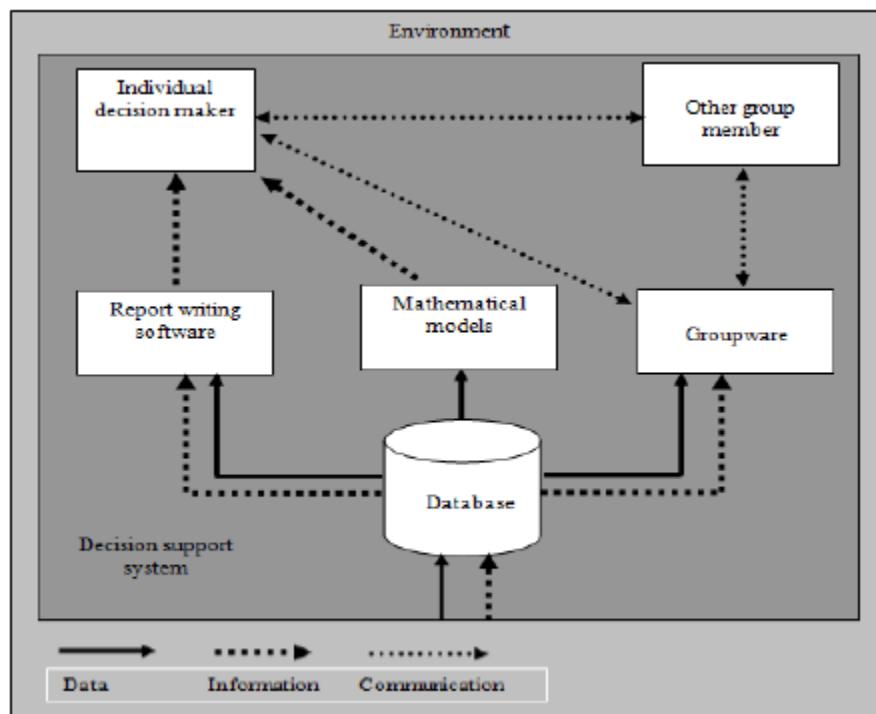
Figure 7.2. A DSS Model

7.6.2.3. Attributes of Decision Support System

1. Flexibility

The systems are flexible so that any semi-structured or unstructured decision making situation can be tackled with ease and speed.

2. **Simple models**

The systems use simple models of decision making. The only change is that a different set of information is sought for the use of different models. The choice of a model depends upon the complexity of decision making.

3. Database

The decision support system needs database(s). The system calls for several inputs from database(s) for decision making. The use of information being common, input to the system is from the database.

7.6.2.4. DSS Characteristics

Decision support system has a number of characteristics, which include following:

- **DSS provide support for decision maker mainly in semi structured and unstructured situations** by bringing together human judgment and computerized information. Such problem cannot be solved (cannot be solved conveniently) by other computerized systems, such as MIS.

- **DSS attempts to improve the effectiveness of decision-making** (accuracy, timeliness, quality) rather than its efficiency (cost of making the decision, including the charges for computer time).

DSS provides support to individuals as well as to groups. Many organizational problems involve group decision-making. The less structured problem frequently requires the involvement of several individuals from different departments and organizational levels.

- **Advanced DSS are equipped by a knowledge component**, which enables the efficient and effective solution of very difficult problems.

- **A DSS can handle large amount of data** for instance advanced database management package have allowed decision makers, to search database for information. A DSS can also solve problems where a small amount of data is required.

- **A DSS can be developed using a modular approach.** With this approach, separate functions of the DSS are placed in separate modules - program or subroutines-allowing efficient testing and implement of systems. It also allows various modules to be used for multiple purposes in different systems.

- **A DSS has a graphical orientation**. It has often been said that a picture is worth a thousand words. Today's decision support systems can help managers make attractive, informative graphical presentations on computer screens and on printed documents. Many of today's software packages can produce line drawing, pie chart, trend line and more. This graphical orientation can help decision makers a better understanding of the true situation in a given market place.

- **A DSS support optimization and heuristic approach**. For smaller problems, DSS has the ability to find the best (optimal) situation. For more complex problems, heuristics are used. With heuristic, the computer system can determine a very good-but not necessarily the best- solution. This approach gives the decision maker a great deal of flexibility in getting computer support for decision making activities.

- **A DSS can perform "what – if" and goal – seeking analysis.** "What – if "analysis is the process of making hypothetical change to problem data and observing impact of the results. In with" what – if "analysis, a manager can make changes to problem data (the number of automobiles for next month) and immediately see the impact on the requirement for subassemblies (engines, windows, etc.) .

7.6.2.5.Types of Decision Support System

1. Status inquiry system

The number of decisions in the operational management and some at the middle management are such that they are based on one or two aspects of a decision making situation. It does not call any elaborate computations, analysis, choice etc. for decision making. If the status is known, the decision is automatic, i.e., the status and solution is unique relation.

2. Data analysis system

These decision systems are based on comparative analysis, and use of a formula or a logarithm. But, these processes are not structured and, therefore, vary. The cash flow analysis, the inventory analysis and the personal inventory systems are examples of the analysis systems. The use of simple data processing tools and business rules are required to develop this system.

3. Information analysis system

In this system, the data is analyzed and information reports are generated. The reports might be having exceptions as a feature. The decision makers use these reports for assessment of the situation for decision making. The sales analysis, the accounts receivable systems, the market research analysis, the MRP systems are examples of this system.

4. Accounting system

These systems are not necessarily required for decision making but they are desirable to keep track of the major aspects of the business or a function. The contents of these systems are more data processing leading to formal reporting, with exceptions, if necessary. These systems account items such as cash, inventory, and personnel and so on and relate it to a norm or norms developed by the management, for control and decision.

7.7. SUMMARY:

This unit provides the complete details about the decision making process, its methods and introduction to decision support systems. The Simon model in decision making plays a major role for the further analysis of the system, as DSS. This unit also discusses the behavioral and organizational decision making concepts, with its analytical modeling procedure. In the characteristics, its types and its attributes are discussed in detail along with the different types of decision structures that can used based on programmed or non-programmed structures of decisions with the complete philosophy of DSS systems.

7.8. KEY WORDS:

Decision support system, Decision making, Behavioral decision making, Attributes, Characteristics, Types of DSS, Decision making concepts.

7.9. EXERCISE:

1. Why do decision making situations arise?

2. Identify few decisions in your life, where the outcomes were known with certainty, risk and uncertainty.

3. Why do two people disagree on the choice of a decision? Is it then better to resort to programmable decision making?

4. Why is more time spent in problem analysis and problem definition as compared to the Time spent on decision analysis?

5. If a person is indecisive, is it due to lack of information support or some human factors or both?

6. Can you automate the process of decision making? The answer is yes. and .no.. Explain. What best must be aimed at?

7. What is the purpose of DSS in MIS?

8. What types of DSS can be embedded in the application?

9. High end DSS system need well conceived problem model and solution criteria to solve the problem. Explain with example.

10. Explain the role of MIS in decision making.

7.10. REFERENCES:

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

UNIT -8: DECISION SUPPORT SYSTEMS

Structure

8.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Identify different DSS
- List out different DSS components
- Analyze Management reporting alternatives

8.1 DECISION STRUCTURES:

In 1971Gorry and Morton classified decisions by its structure into three levels; **structured decision,** in which the ingredients, or variables, that comprise a decision are known and they can be measured quantitatively. **Unstructured decision** is one that the ingredients, or variables, that comprise a decision can not be measured quantitatively. **Semi structured decision** is in between structured and unstructured decisions. Usually most business decisions are semi structured. Then Gory and Morton continued on computer applications in terms of the degree of structure in the

decision they are intended to make and the management level that they support (Gorry, Michael, 1971). Figure 8.1. shows the Gory and Morton grid classification for decision structure .

	Management levels		
	Operation control	Management Control	Strategic planning
Structured	Accounting receivable Order entry Inventory Control	Budget analysis Engineered cost Short term Forecasting	Tanker fleets mix Warehouse and factory location
Degree Of Decision Structured — Semi structured	Production scheduling Cash management	Variance analysis overall budget Budget preparation	Mergers and acquisition New product planning
Unstructured	PERT/ Cost System	Sale and production	R&D planning

Figure 8.1. Decision structure

8.1.1. Types of Decision Support System

The different types of decision structures based on management level are as follows:

i. Status inquiry system

The number of decisions in the operational management and some at the middle management are such that they are based on one or two aspects of a decision making situation. It does not call any elaborate computations, analysis, choice etc. for decision making. If the status is known, the decision is automatic, i.e., the status and solution is unique relation.

ii. Data analysis system

These decision systems are based on comparative analysis, and use of a formula or a logarithm. But, these processes are not structured and, therefore, vary. The cash flow analysis, the inventory analysis and the personal inventory systems are examples of the analysis systems. The use of simple data processing tools and business rules are required to develop this system.

iii. Information analysis system

In this system, the data is analyzed and information reports are generated. The reports might be having exceptions as a feature. The decision makers use these reports for assessment of the situation for decision making. The sales analysis, the accounts receivable systems, the market research analysis, the MRP systems are examples of this system.

iv. Accounting system

These systems are not necessarily required for decision making but they are desirable to keep track of the major aspects of the business or a function. The contents of these systems are more data processing leading to formal reporting, with exceptions, if necessary. These systems account items such as cash, inventory, and personnel and so on and relate it to a norm or norms developed by the management, for control and decision.

v. Model based systems

These systems are simulation models or optimization models for decision making. These decisions, generally, are one time and infrequent and provide general guidelines for operation or management. The product mix decision, the material mix, the job scheduling rules, and the resources or asset or facilities planning systems are the examples.

_____

8.2. DSS COMPONENTS:
_____

A decision support system is a specific type of information system that consists of many parts namely Data management subsystem, Model management subsystem, Dialogue subsystem or user interface system and knowledge management subsystem as shown in figure 4.2 below. Its detail representation is as shown in the figure 8.2a.
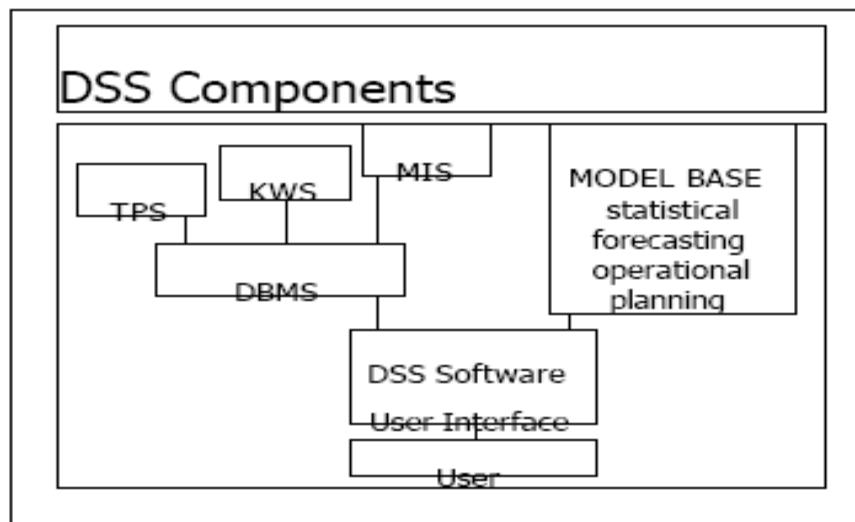
Fig.8.2. Components of DSS
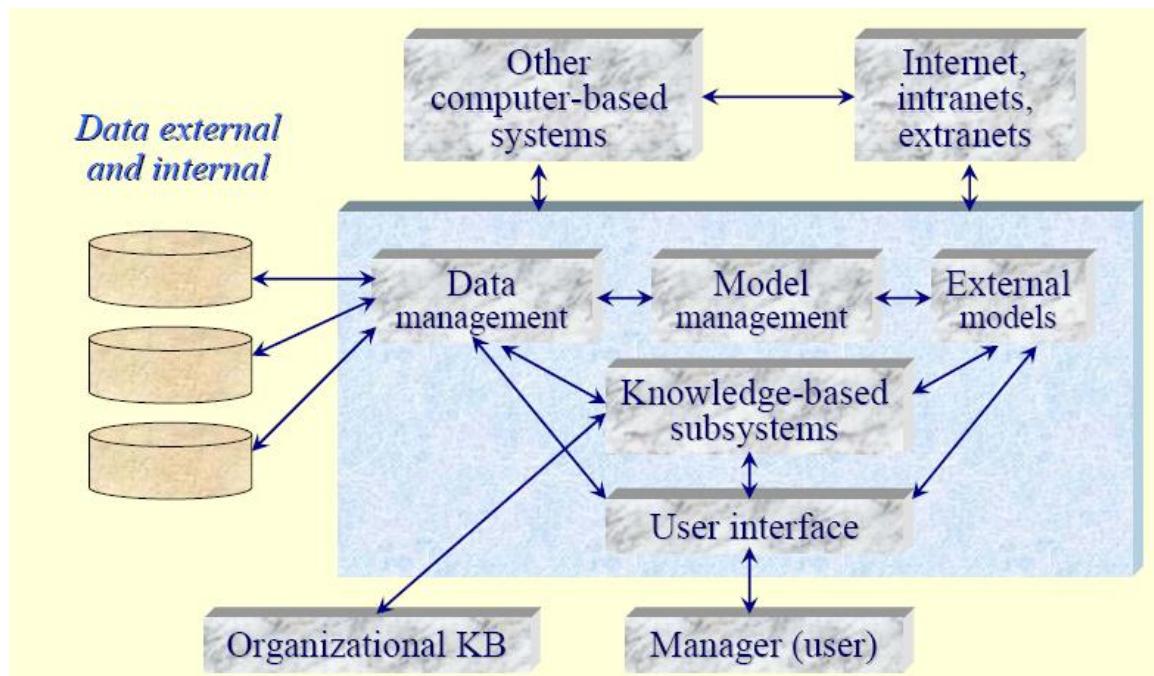
Fig.8.2a Detailed view of DSS architecture

The *Data Management Subsystem* includes a database that contains relevant data for the situation and managed by software called the **Database Management System** (DBMS) and can be inter-

connected with the corporate data *warehouse*, a repository for corporate relevant decision making data. Usually, the data are stored or accessed via a database Web server.

The *Model Management Subsystem* is a software package that includes *financial, statistical, management science or other quantitative models* that provide the system's analytical capabilities and appropriate software management. Modeling languages for building custom models are also included. This software is called a **Model Base Management System** (MBMS).

The *User Interface Subsystem* allows the interaction between the computer and the decision maker. It is used by the user (is part of system) to communicates with and commands the DSS. The Web browser provides a familiar and consistent **Graphical User Interface** (GUI) structure for most DSS.

The *Knowledge-Based Management Subsystem* can support any of the other subsystems or act as an independent component. It provides intelligence to augment the decision maker's own. It can be interconnected with the organization's knowledge repository (part of the **Knowledge Management System** - KMS) which is called the **Organizational Knowledge Base.** Knowledge can be provided via Web servers. Many artificial intelligence methods have been implemented in Web development system such as Java and are easy to integrate into the other DSS components. A DSS must include the three major components: DBMS, MBMS and *user interface*.

The *Data Management Subsystem* is composed of the following elements:

• DSS database,

• SBMS,

• Data directory,

• Query facility.

These elements and the interaction of the data management subsystem with the other parts of the DSS are shown the figure 8.3.
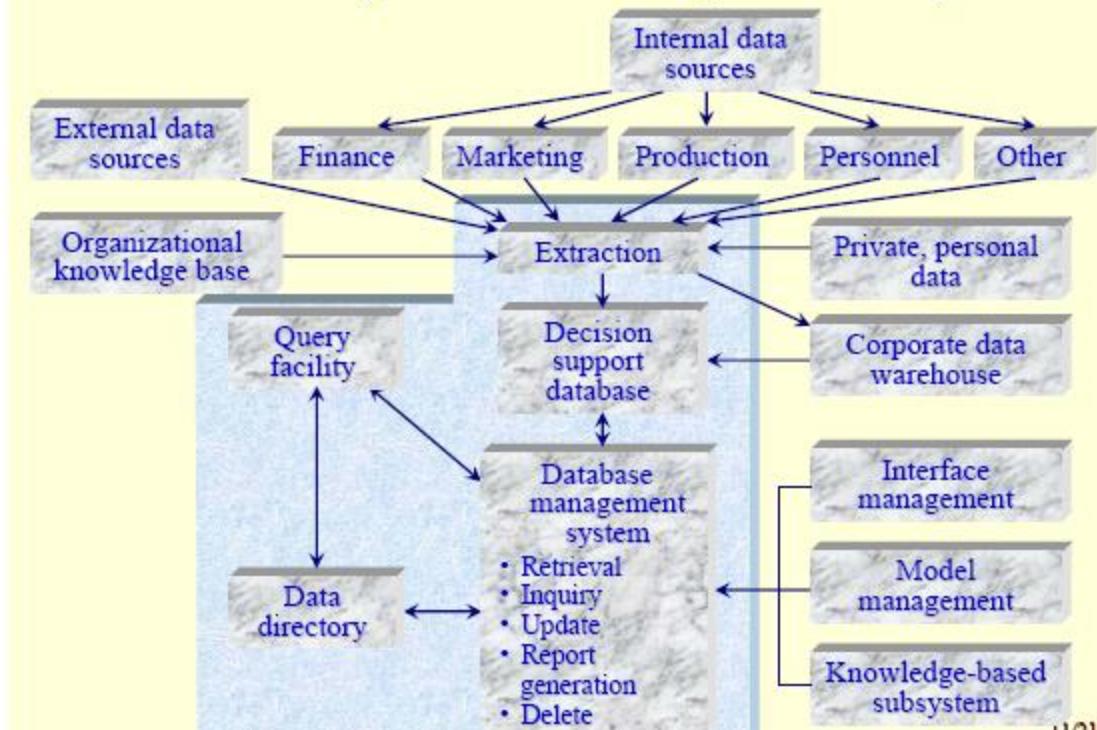
Fig.8.3. Data management subsystem

A **Database** is a collection of interrelated data, organized to meet the needs and structure of an organization that can be used by more than one person for more than one application.

• Internal data come mainly from the organization's transaction processing system.

• External data include industry data, market search data, census data, regional employment data, government regulation, national economic data, and so on.

• Private data can include guidelines used by specific decision makers and assessments of specific data or situation.

Data organization:. When a DSS should have a standalone database:

• In small DSS data can be entered directly into models, sometimes extracted directly from larger databases.

• In large organization that uses extensive amounts of data, data are organized in a data warehouse and used when needed for analysis not for transaction process.

Extraction is an operation that enables to create or load a DSS database or a data warehouse – it is often necessary to capture data from several sources. It allows the importing of files,

108

summarization, standardization filtration and condensation of data (corresponding process are *extraction, transformation* and *load* – ETL).

The *Query Facility* allows to access, manipulate and query data. It accepts requests for data from other DSS components, determines how the results can be filled, formulates the detailed requests and returns the results to the issuer of the request. It includes a special query language (SQL). Important functions of a DSS query system are selection and manipulation operations.

The Data Directory is a catalog of all data in a database. It contains data definitions and its main function is to answer questions about the availability of data items, their source and their exact meaning. It supports the addition of new entries, deletion of entries and retrieval of information about specific objects.

Data Security is required by confidentiality laws. In some situations, unauthorized access extends to modifying data in place or destroying it. Data must be protected from unauthorized access through security measures such is ID and Password protection. It is important to identify exactly who has access to and why they have access to specific sets of data and to what level an individual is allowed to change the data in the system. Data can be encrypted so that even in case of unauthorized access the viewed data is scrambled an unintelligible.

The Model Management Subsystem of a DSS is composed of the following elements:

• *Model base* – contains routine and special statistical, financial, forecasting, management science and other quantitative models that provide the analysis capabilities in a DSS. The models can be:strategic, tactical, operational and analytical.

• *Model Building Blocks and Routines* - MBMS – the model base can contain it in addition for such applications as data analysis or can be used as components of larger models.

• *Modeling language* – **.**NET Framework languages, C++, Java, OLAP (work with models in data analysis), SLAM (simulation), SPSS (statistical packages)

• *Model directory* – similar to a database directory, it is a catalog of all the models and other software in the model base. It contains model definitions and its main function is to answer questions about the availability and capability of the model.

• *Model execution, integration and command processor* – control *Model execution*, *Model integration*. A *model command processor* is used to accept and interpret modeling instructions from the user interface component to the MBMS, model execution or integrating functions. These elements and their interfaces with other components are shown in the figure 8.4.
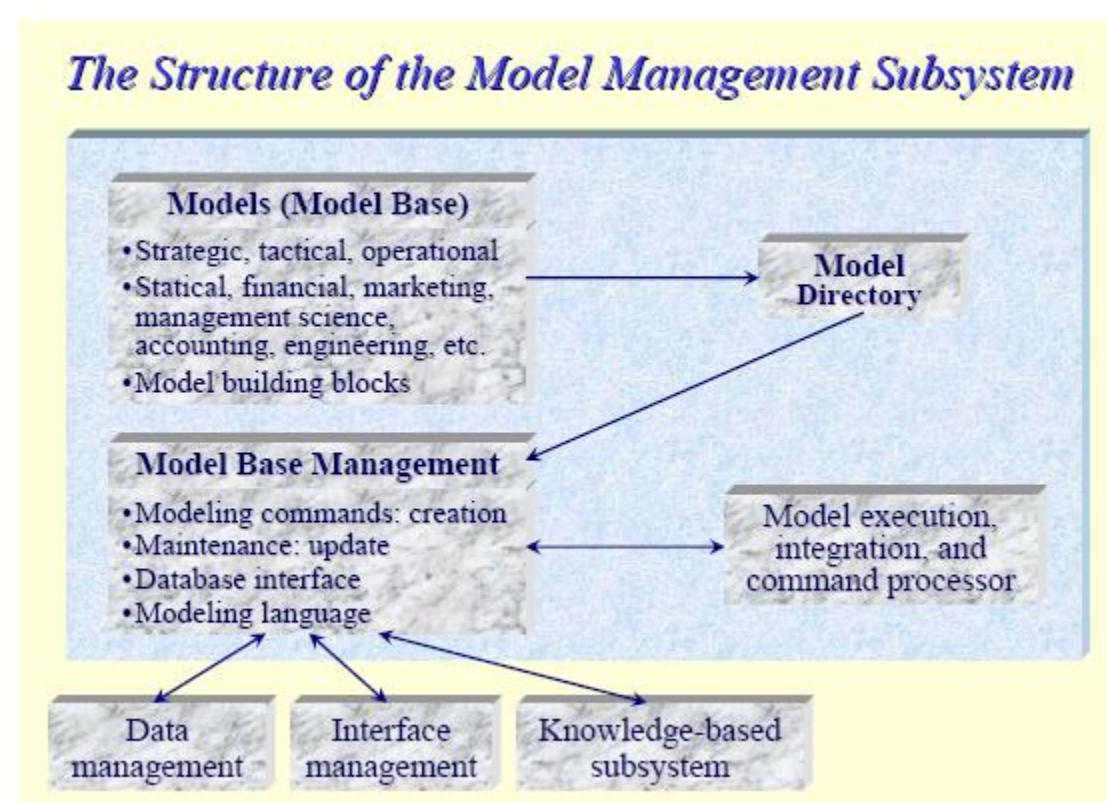
Fig. 8.4. Model management subsystem

The User Interface Subsystem covers all aspects of communication between a user and the DSS as shown in figure 8.5. It is managed by software called the *user interface management system* (UISM) = *dialog generation and management system*. The user interacts with the computer via an action language processed by the UIMS. It enables the user to interact with the model management and data management subsystems. The user interface component may include a natural language processor or can use standard objects through a *graphical user interface* (GUI). A variety of portable devices have been made Web-ready, including notebook and tablet PCs, PDAs, pocket PCs (another type of PDA) and cell phones. Many of these devices include technology to tap directly into the Web. They allow either handwritten input and some DSS user

interfaces utilize natural language input (human language). The NASA has developed a voice input/output system for astronauts to use in space.
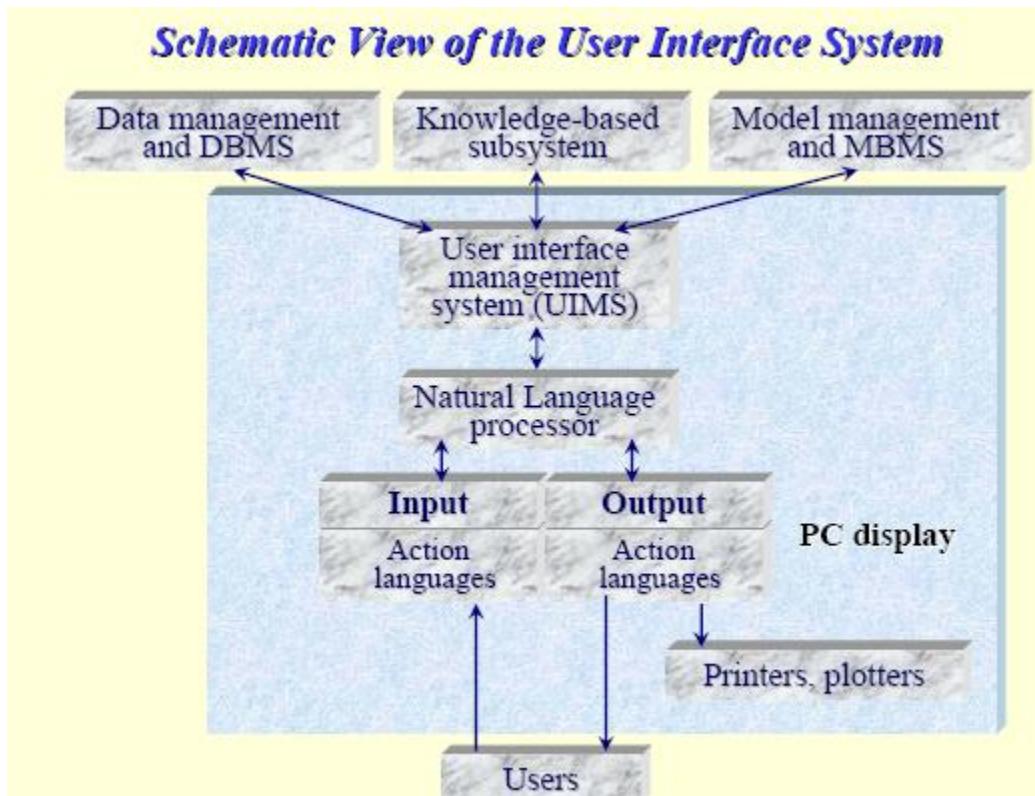
Fig.8.5. User interface system

The Knowledge-Based Subsystem

Many unstructured or semi-structured problems are so complex that their solutions require expertise provided by an ES or another intelligent system. Advanced DSS are equipped with a component called *Knowledge-Based Subsystem*. Knowledge components may be provided by ES, neural networks, intelligent agents, fuzzy logic, case-based reasoning systems, etc. The knowledge component consists of one or more intelligent systems. Knowledge-based management software provides the necessary execution and integration of the intelligent system. A DSS that includes such a component is called an *intelligent DSS*, a *DSS/ES*, an *expert-support system*, an *active DSS* or a *knowledge-based DSS*.

The Decision Support System User

The user, manager or decision maker can be an individual or a group, depending on who is responsible for the decision, and provides the *human intellect*. An *intermediary* allows a manager to benefit form a DSS:

 • *Staff assistants* have specialized knowledge about management problems and some experience with decision support technology.

• *Expert tool users* perform tasks that the problem solver does not have the skill or training to perform.

• *Business analysts* have a knowledge of the application area, a formal business administration education and considerable skill in using DSS construction tools.

• *Facilitators* control and coordinate the use of software to support the work of people working in groups, and are also responsible for the conduct of workgroups sessions.

8.3. MANAGEMENT REPORTING ALTERNATIVES:

The role of the MIS in an organization can be compared to the role of heart in the body. The information is the blood and MIS is the heart. In the body the heart plays the role of supplying pure blood to all the elements of the body including the brain. The MIS plays exactly the same role in the organization. The system ensures that an appropriate data is collected from the various sources, processed, and sent further to all the needy destinations. The system is expected to fulfill the information needs of an individual, a group of individuals, the management functionaries: the managers and the top management. The MIS helps the clerical personnel in the transaction processing and answers their queries on the data pertaining to the transaction, the status of a particular record and references on a variety of documents. The MIS helps the middle management in short them planning, target setting and controlling the business functions. It is supported by the use of the management tools of planning and control. The MIS plays the role of information generation, communication, problem identification and helps in the process of decision making. The MIS, therefore, plays a vita role in the management, administration and operations of an organization.

A Management Information System is an integrated user-machine system, for providing information, to support the operations, management, analysis and decision-making functions in an organization. In other words system utilizes computer hardware & software, manual procedures, models for analysis, planning, control & decision making and a database

MIS provides information to the users in the form of reports and output from simulations by mathematical models. The report and model output can be provided in a tabular or graphic form.

Management Reporting Alternatives

MIS provide a variety of information products to managers which includes 3 reporting alternatives:

1. Periodic Scheduled Reports

2. Exception Reports

3. Demand Reports and Responses

Management Reporting Alternatives

1. MIS provide a variety of information products to managers which includes 3 reporting alternatives:

2. Periodic Scheduled Reports: E.g. Weekly Sales

Analysis Reports, Monthly Financial Statements etc.

3. Exception Reports: E.g. Periodic Report but contains

information only about specific events.

4. Demand Reports and Responses: E.g. Information

on demand.

MIS Characteristics:
1. Management Oriented/directed
2. Business Driven
3. Integrated
4. Common Data Flows
5. Heavy Planning Element
6. Subsystem Concept
7. Flexibility & Ease of Use
8. Database
9. Distributed Systems
10. Information as a Resource

8.4. SUMMARY:

This unit describes about the necessity of decision making in the management process its structure after the modification of Simon model of decision making process. It also discusses the different types of components used in the architectural design of a DSS system in detail along with their supportive facilities and flexibilities. It also briefs out the output representation of the informational details of the management systems using different reporting alternatives as periodic and a periodic schedules representations.

8.5. KEY WORDS:

Decision support system, Structure of decision, decision components, knowledge based system, DBMS, informational systems, user interface, reporting methods.

8.6. EXERCISES:

1. Explain the different types of structures used in decision making and its analysis proceudre.

2. In detail explain the different components involved in architecture of the DSS. Identify the importance of DBMS component.

3. Explain the different management reporting alternatives present the MIS system and DSS systems

4. Justify the importance of the different components of DSS in MIS.

5. Identify the difference between the decision making and the decision making strucutes.

8.7. REFERENCES:

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

Module 3

UNIT -9: Business Model V/S Business Plan

Structure

9.0 LEARNING OBJECTIVES:

After studying this unit, you will be able to

- Identify the competitive advantages in business

- Exploring the importance of SWOT analysis

- Brief out the difference between business and model plan

- Explain the different IT strategies and its challenges

- Analyzing the importance of the change management

_____

9.1.PLANNING FOR COMPETITIVE ADVANTAGES:

_____

Competitive advantage happens when companies acquire or develop a combination of attributes that allow it to outperform its competitors. These attributes might include access to natural resources, such as high grade ore or inexpensive power, or access to highly trained and skilled personnel human resources. Other advantages could include better use of technology, etc. This is well utilised in business models.

_____

9.2.SWOT ANALYSIS:

_____

SWOT stands for Strengths, Weaknesses, Opportunities and Threats. It is a way of summarizing the current state of a company and helping to devise a plan for the future, one that employs the existing strengths, redresses existing weaknesses, exploits opportunities and defends against threats.

Strengths:

• Identify skills and capabilities that you have.

• What can you do particularly well, relative to rivals?

• What do analysts consider to be your strengths?

• What resources do you have?

• Is your brand or reputation strong?

Weaknesses:

• What do rivals do better than you?

• What do you do poorly?

• What generates the most customer dissatisfaction and complaints?

• What generates the most employee dissatisfaction and complaints?

• What processes and activities can you improve?

Opportunities:

• Where can you apply your strengths?

• How are your customers and their needs changing?

• How is technology changing your business?

• Are there new markets for your strengths? (e.g. foreign)

• Are there new ways of producing your products?

• Are your rivals' customers dissatisfied?

Threats:

• Are customers able to meet their needs with alternative products?

• Are customers needs changing away from your product?

• What are your competitors developing?

• Are your rivals improving their product offerings or prices?

• Is new technology making your product obsolete?

• Is your cash-flow and debt position healthy?

• Are your employees satisfied? Is turnover high?

• Is new competition coming?

• Are sales growing slower than the industry average

9.3.BUSINESS MODELS AND PLANNING:

9.3.1.Business Model:

A business model is **not** a business plan and a business plan is not a business model. To execute our business model business plan documents are very much necessary. Business model is the proprietary methodology that is used to acquire service and to retain customers.

Most small business models are strong at the business inception. However, over time, all business models erode. Over a long enough period of time, they begin to fail. A business model is more encompassing. In fact, competitive advantage is a sub-component of a business model. A business model takes 8 areas of a business into consideration including the area of competitive advantages that are discussed as follows.

Business Model vs Competitive Advantage

Although competitive advantage is critical, it is only one of the eight key areas of a business model. Competitive advantage has a role in many of the eight areas. However, analyzing the strength of a business based only on competitive advantage would not paint a complete picture.

The eight components of the business model, include competitive advantage. The eight essential areas to a business model under business plan include the following figure 9.1.:

- Must have excellent margins
- Must be easy to sell
- Must have The Four Capitals: Intellectual Capital, Financial Capital, Human Capital and Brand Capital
- Must be able to maintain ongoing competitive advantage
- Must have quality customers
- Must have longevity of the industry
- Must provide for the owner's graceful exit
- Must avoid pitfalls
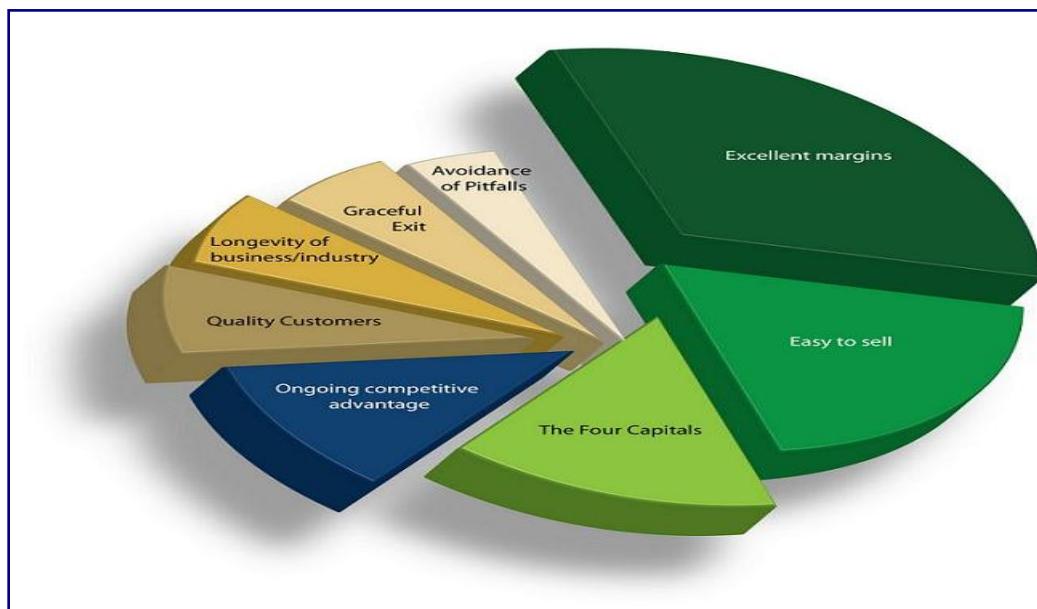
Fig.9.1 Components of a business model

9.3.2.Business Plan:

A **business plan** is a formal statement of a set of business goals. It may also contain background information about the organization or team attempting to reach those goals. Business plans may also target changes in perception and branding by the customer, client, taxpayer, or larger community. When the existing business is to assume a major change or when planning a new

venture, a 3 to 5 year business plan is required, since investors will look for their annual return in that timeframe. The most common issues that are considered with business plans are as follows.

i. Too vague

Some business plans like "capture significant market share." How will you capture the share? Are the competitors going away? How is the product quality, is it better or significantly differentiated? Do customers care enough to switch? How the difference in product is communicated? Have the product undergone testing for marketing and reaching your assumptions and requirements?

ii. Justifies a foregone conclusion

Sometimes the creation of a business plan leads to the conclusion that a better plan or model is needed. Done right, a business plan should force the creator to think critically about all aspects of the business. Done wrong, it's just words on paper leading to the inevitable conclusion that this business is a great idea in all regards.

3. Too much SWAG

Particularly in the sales projections, many business plans have too much guessing. Sometimes we cannot accurately predict sales for a future offering. In many markets, a one percent share would be great and difficult to come by. The plan cannot simply assume facts and figures, some form of study or scientific bases should be used to back up all assumptions. If possible, every income and expense line in the projections should have a footnote with the logic, reasoning and facts used to create it.

4. Not enough meat on the bones

A great business plan must go into great detail as well as cover multiple scenarios, both good and bad. Too many business plans touch all the bases in the business plan template and then move onto the next section.

5. Too much reliance on business plan templates

Business plan templates are great for creating a structure for the document. However, the standard canned language will get you a standard, canned business plan. Using the template for the structure and example of the content is required . Then erase everything but the headings and create the plan from scratch.

6. Having someone else write your plan

Anyone who has written a great business plan and then executed it well can tell you that it's not the final document which has value. It's the process of creating it. You could almost throw the business plan away if you do it right. Business planning is about the process, not the document. This is why templates are dangerous. If you are just filling in the blanks, you really are not getting 90% of the benefit of a business plan.

7. Ignoring the business model

Many business plans indirectly touch on the business model in the marketing sections. However, there are eight areas to a business model. Many of these areas are completely missed in many business plans. We recommend a large, separate section detailing the business model. You could make the argument that if you complete the business model portion of the business plan, the financial analysis is the only other significant portion.

9.4. BUSINESS/IT PLANNING:

Business/IT Plan

The business' operations revolve around the business model. The operations are created to meet, if not exceed, the aspects that are defined within that model. The business plan identifies and explains the business' operations, including its departments, staffing, location, equipment, marketing strategies and financial status of the business.

A plan is a predetermined course of action to be taken in the future. It is a document containing the details of how the action will be executed and it is made against a time scale. The goals and the objective that a plan is supposed to achieve are the prerequisites of a plan. The setting of the goals and the objective is the primary task of the Management without which planning cannot begin.

Planning means taking a deep look into the future and assessing the likely events in the total business environment and taking a suitable action to meet any eventuality. It further means generating the courses of action to meet the most likely eventuality. Planning is a dynamic process. As the future becomes the present reality, the course of action decided earlier may require a change. Planning, therefore, calls for a continuous assessment of the predetermined course of action versus the current requirements of the environment. The essence of planning is

to see the opportunities and the threats in the future and predetermine the course of action to convert the opportunity into a business gain, and to meet the threat to avoid any business loss.

Planning involves a chain of decisions, one dependent on the other, since it deals with along term period. A successful implementation of a plan means the execution of these decisions in a right manner one after another. Planning, in terms of future, can be long-range or short-range. Long-range planning is for a period of five years or more, while short-range planning is for one year at the most. The long-range planning is more concerned about the business as a whole, and deals with subject like the growth and the rate of growth, the direction of business, establishing some position in the business world by way of a corporate image, a business share and so on. On the other hand, short-range planning is more concerned with the attainment of the business results of the year. It could also be in terms of action by certain business tasks, such as lunching of a new product, starting a manufacturing facility, completing the project, achieving intermediate milestones on the way to the attainment of goals. The goals relate to long-term planning and the objective relate to the short-term planning. There is a hierarchy of objectives which together take the company to the attainment of goals. The plans, therefore, relate to the objectives when they are short-range and to goals when they are the long-range.

Long-range planning deals with resource selection, its acquisition and allocation. It deals with the technology and not with the methods or the procedures. It talks about the strategy of achieving the goals. The right strategy improves the chance of success tremendously. At the same time, a wrong strategy means a failure in achieving the goals. Corporate business planning deals with the corporate business goals and objectives. The business may be a manufacturing or a service; it may deal with the industry or trade; may operate in a public or a private sector; may be a national or an international business. Corporate business planning is a necessity in all cases. Though the corporate business planning deals with a company, its universe is beyond the company. The corporate business plan considers the world trends in the business, the industry, the technology, the international markets, the national priorities, the competitors, the business plans, the corporate strengths and the weaknesses for preparing a corporate plan. Planning therefore, is a complex exercise of steering the company through the complexities, the difficulties, the inhibitions and the uncertainties towards the attainment of goals and objective.

9.5. BUSINESS/IT STRATEGIES:

Strategy formulation is a complex task based on the strength and the weakness of the organization and the mission and goals it wishes to achieve. Strategy formulation is the responsibility of the top management and the top management relies on the MIS for information. There are various business strategies such as overall company growth, product, market, financing and so on. MIS should provide the relevant information that would help the management in deciding the type of strategies the business needs. Every business may not require all the strategies all the time. The type of strategy is directly related to the current status of business and the goals it wishes to achieve. The MIS is supposed to provide current information on the status of the business vis-à-vis the goals. MIS is supposed to give a status with regard to whether the business is on a growth path or is stagnant or is likely to decline, and the reasons thereof. If the status of the business shows a declining trend, the strategy should be of growth. If business is losing in a particular market segment, then the strategy should be a market or a product strategy. The continuous assessment of business progress in terms of sales, market, quality, profit and its direction becomes the major role of MIS. It should further aid the top management in strategy formulation at each stage of business. The business does not survive on a single strategy but it requires a mix of strategy operating at different levels of the management. For example, when a business is on the growth path, it would require a mix of price, product and market strategies. If a business is showing a decline, it would need a mix of price-discount, sales promotion and advertising strategies. The MIS is supposed to evaluate the strategies in terms of the impact they have on business and provide an optimum mix. The MIS is supposed to provide a strategy-pay off matrix for such an evaluation.

A strategy means a specific decision (S) usually but not always regarding the deployment of the resources to achieve the mission or goals of the organization The right strategy beats competition and ensures the attainment of goals while a wrong strategy fails to achieve the goals Correction and improvement in case of a wrong strategy is possible at a very high cost .such a situation is described as a strategic failure. If a strategy considers a single point of attack by a specific method it is a mixed strategy. If a strategy acts on many fronts by different means then it is a

mixed strategy the business strategy could be series of pure strategies handling several external forces simultaneously.

Hence the strategy may fall in any area of the business and may deal with any aspects of the business It could be aspects like price market product technology process quality service finance management strength and so on when the management decides to fight the external forces of a single area by choice it becomes a pure strategy if it uses or operates in more then one area then it becomes a mixed strategy. The success of an organization in spite of its strength depends on the strategic moves or planning the management pursues. The strategy may be pure or mixed It can be classified into four broad classes 1. Overall Company Strategy 2. Growth Strategy 3.Product Strategy and 4. Marketing Strategy. These strategies are applicable to all the types of businesses and industries.

Overall Company Strategy:

This strategy a very long- term business perspective deals with the overall strength of the entire company and evolves those policies of the business which will dominate the course of the business movement it is the most productive strategy if chosen correctly and fatal if chosen wrongfully the other strategies act under the overall company strategy. To illustrate the overall company strategy following examples is given:

1. A two wheeler manufacturing company will have a strategy of mass production and an aggressive marketing.

2. A computer manufacturer will have a strategy of adding new products every two or three years.

3. A consumer goods manufacturer will have a strategy of maximum reach to the consumer and exposure by way of a wide distribution network.

4. A company can have a strategy of remaining in the low price range and catering to the masses.

5. Another company can have a strategy of expanding very fast to capture the market.

6. A third company can have a strategy of creating a corporate brand image to build a brand loyalty e.g. Escorts , kirloskar , Godrej ,Tata , Bajaj, BHEL , MTNL. The overall company strategy is broad- based having a far reaching effect on the different facets of business and forming the basis for generating strategies in the other areas of business.

9.6. IMPLEMENTATION CHALLENGES OF PLANNING IN MIS:

Some of the distinguishing challenges that the people face while planning, using or approving

management information systems are:

• MIS requires a wide variety of knowledge areas including accounting, finance, marketing and manufacturing. Therefore having both technical and practical experience in these subjects is very useful.

• Both technology and technology-related products are emerging at very high pace. Consequently no one possibly be proficient in all new technologies and compromises have to be taken.

• Many terms used in MIS are inaccurate and controversial because of high pace of new hardware, software and communication technology.

• MIS problems are difficult to define. Some times a situation may be seen as a problem but in fact it may be a symbol only.
.
• There is a lack of sympathetic relationship between MIS personnel and users and management and MIS personnel because employees are more loyal to their profession rather than needs of the organizations.

• No universal standards have been established regarding how much to spend on MIS. Planning therefore, is a complex exercise of steering the company through the complexities, the difficulties, the inhibitions and the uncertainties towards the attainment of goals and objective.

9.6.1.Dimensions of Planning

The corporate business plan has five dimensions. These are time, entity, organization, elements

and characteristics.

- Time

The plan may either be long-range or short-range, but the execution of the plan is, year after

year. The plan is made on a rolling basis where every year it is extended by one year, keeping the

plan period as the next five years. The rolling plan provides an opportunity to correct or revise

the plan in the light of any new information the planner may receive.

- Entity

The plan entity is the thing on which the plan is focused. The entity could be the production in

terms of quantity or it could be a new product. It could be about the finance, the marketing, the

capacity, the manpower or the research and development. The goals and the objectives would be stated in terms of these entities. A corporate plan may have several entities.

- Organization

The corporate plan would deal with the company as a whole, but it has to be broken down for its subsidiaries, if any, such as the functional groups, the divisions, the product groups and the projects. The breaking of the corporate business plan into smaller organizational units helps to fix the responsibility for execution. The corporate plan, therefore, would be a master plan and it would comprise several subsidiary plans.

- Elements

The plan is made out of several elements. The plan begins with the mission and goal which the organization would like to achieve. It may provide a vision statement for all to understand as also the purpose, focus, and direction the organization would like to move towards. It would at the outset, place certain policy statements emerging out of management.

- Characteristics

There are no definite characteristics of a corporate plan. The choice of characteristics is a matter of convenience helping to communicate to everybody concerned in the organization and for an easy understanding in execution. The features of a plan could be several and could have several parts. The plan is a confidential written document subject to charge, and known to a limited few in the organization. It is described in the quantitative and qualitative terms. The long-term plan is normally flexible while the short-term one is generally not. The plan is based on the rational assumptions about the future and gives weightage to the past achievements and corporate strength and weal messes. The typical characteristics of a corporate plan are the goals, the resources, the important milestones, the investment details and a variety of schedules.

9.7. CHANGE MANAGEMENT:

The change management process is the sequence of steps or activities that a change management team or project leader would follow to apply change management to a project or change. Based on Prosci's research of the most effective and commonly applied change, most change management processes contain the following three phases:

Phase 1 - Preparing for change (Preparation, assessment and strategy development)

Phase 2 - Managing change (Detailed planning and change management implementation)

Phase 3 - Reinforcing change (Data gathering, corrective action and recognition)

These phases result in the following approach as shown below in Figure 9.2.
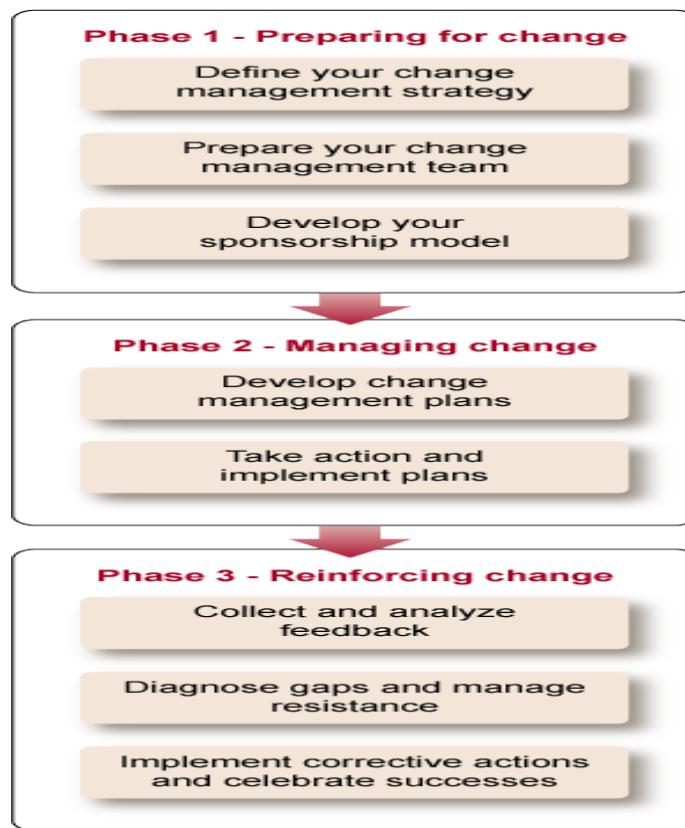
Figure 9.2. - Change Management

 It is important to note what change management is and what change management is not, as defined by the majority of research participants. Change management is not a stand-alone process for designing a business solution.

Change management is a necessary component for any organizational performance improvement process to succeed, including programs like: Six Sigma, Business Process Reengineering, Total Quality Management, Organizational Development, Restructuring and continuous process improvement. Change management is about managing change to realize business results. These are discussed in terms of the following activities.

i)   Readiness assessments:

Assessments are tools used by a change management team or project leader to assess the organization's readiness to change. Readiness assessments can include organizational assessments, culture and history assessments, employee assessments, sponsor assessments and change assessments. Each tool provides the project team with insights into the challenges and opportunities they may face during the change process.

- Assess the scope of the change, including: How big is this change? How many people are affected? Is it a gradual or radical change?
- Assess the readiness of the organization impacted by the change, including: What is the value- system and background of the impacted groups? How much change is already going on? What type of resistance can be expected?
- Assess the strengths of your change management team.
- Assess the change sponsors and take the first steps to enable them to effectively lead the change process.

ii) Communication and communication planning:

Many managers assume that if they communicate clearly with their employees, their job is done. However, there are many reasons why employees may not hear or understand what their managers are saying the first time around. In fact, you may have heard that messages need to be repeated 6 to 7 times before they are cemented into the minds of employees. That is because each employee's readiness to hear depends on many factors. Effective communicators carefully consider three components: the audience, what is said and when it is said.

For example, the first step in managing change is building awareness around the need for change and creating a desire among employees. Therefore, initial communications are typically designed to create awareness around the business reasons for change and the risk of not changing. Likewise, at each step in the process, communications should be designed to share the right messages at the right time.

Communication planning, therefore, begins with a careful analysis of the audiences, key messages and the timing for those messages. The change management team or project leaders must design a communication plan that addresses the needs of front-line employees, supervisors

and executives. Each audience has particular needs for information based on their role in the implementation of the change.

iii) Coaching and manager training for change management:

Supervisors will play a key role in managing change. Ultimately, the direct supervisor has more influence over an employee's motivation to change than any other person at work. Unfortunately, supervisors as a group can be the most difficult to convince of the need for change and can be a source of resistance. It is vital for the change management team and executive sponsors to gain the support of supervisors and to build change leadership. Individual change management activities should be used to help these supervisors through the change process. Once managers and supervisors are on board, the change management team must prepare a coaching strategy. They will need to provide training for supervisors including how to use individual change management tools with their employees.

iv)Training and training development:

Training is the cornerstone for building knowledge about the change and the required skills. Project team members will develop training requirements based on the skills, knowledge and behaviors necessary to implement the change. These training requirements will be the starting point for the training group or the project team to develop training programs.

v)Sponsor activities and sponsor roadmaps:

Business leaders and executives play a critical sponsor role in change management. The change management team must develop a plan for sponsor activities and help key business leaders carry out these plans. Sponsorship should be viewed as the most important success factor. Avoid confusing the notion of sponsorship with support. The CEO of the company may support your project, but that is not the same as sponsoring your initiative.

Sponsorship involves active and visible participation by senior business leaders throughout the process. Unfortunately many executives do not know what this sponsorship looks like. A change agent's or project leader's role includes helping senior executives do the right things to sponsor the project.

vi)Resistance management:

Resistance from employees and managers is normal. Persistent resistance, however, can threaten a project. The change management team needs to identify, understand and manage resistance

throughout the organization. Resistance management is the processes and tools used by managers and executives with the support of the project team to manage employee resistance.

vii)Data collection, feedback analysis and corrective action:

Employee involvement is a necessary and integral part of managing change. Managing change is not a one way street. Feedback from employees is a key element of the change management process. Analysis and corrective action based on this feedback provides a robust cycle for implementing change.

viii)Celebrating and recognizing success:

Early successes and long-term wins must be recognized and celebrated. Individual and group recognition is also a necessary component of change management in order to cement and reinforce the change in the organization.

The final step in the change management process is the after-action review. It is at this point that you can stand back from the entire program, evaluate successes and failures, and identify process changes for the next project. This is part of the ongoing, continuous improvement of change management for your organization and ultimately leads to change competency.

_____

9.8. DEVELOPING BUSINESS (IT STRATEGIES)IT SOLUTIONS:

_____

Long- range Strategic planning:

Like any other business activity planning also has a process and methodology. It goes without any extra emphasis that the corporate planning is a top management responsibility. It begins with deciding the social responsibility and proceeds to spell out the business mission and goals and the strategies to achieve them. In the very beginning of the planning process it is necessary to establish and communicate to all concerned the social and economic responsibilities of the organization. In order to discharge these responsibilities it is necessary to decide the purpose of the organization for which it works. Many organizations call it a mission. The mission or the aim of an organization is a broad statement of the organizations. Existence sets the direction of the organization and decides the scope and the boundaries of the business. The task after deciding the mission or the aim is to set the goal (s) for the organization. The goal is more specific and has a time scale of three to five years. It is described in the quantitative terms in the form of a ratio a norm or a level of certain business aspect such as the largest share leader in the industry

dominant in certain product quality reach and distribution etc. The goals become a reference for the top management in planning the business activities.

After determining the mission and the goals the next task is to set various objectives for the organization The objectives are described in terms of business results to be achieved in a short duration of a year or two The objectives are measurable and can be monitored with the help of business tools and technologies Objective may be the profitability the sales the quality standard the capacity utilization etc. When achieved, the objectives will contribute to the accomplishment of the goals and subsequently the mission.

The next step in the planning process is to set targets for more detailed working and reference The objective of the business is to be translated in terms of functional and operational units for easy communication and decision making. The targets may be monthly for the sales production inventory. The targets will be the direct descendants of the objective(s) The success in achieving the goals and objective is directly dependent on the managements business strategies business is like a war where two or more business competitors are set against each other to win and are constantly in search of a strategy manner in which the resources, such as the men, the material, the money and the knowhow will be put to use over a period to achieve the goals. The resources of an organization being faced by it the game is of evolving strategies and counter strategies to win.

The development of the strategy also considers the environmental factors such as the tech nology, the markets, the life style, the work culture, and the attitudes. The policies of the Government and so on a strategy helps to meet the external forces affecting the business development effectively and further ensures that the goals and the objectives are achieved. The development of the strategy considers the strength of the organization in deploying the resources and unstructured exercise of a complex nature riddled with the uncertainties (see Fig. 9.3.) it sets the guidelines for use of the resources in kind and manner during the planning period.
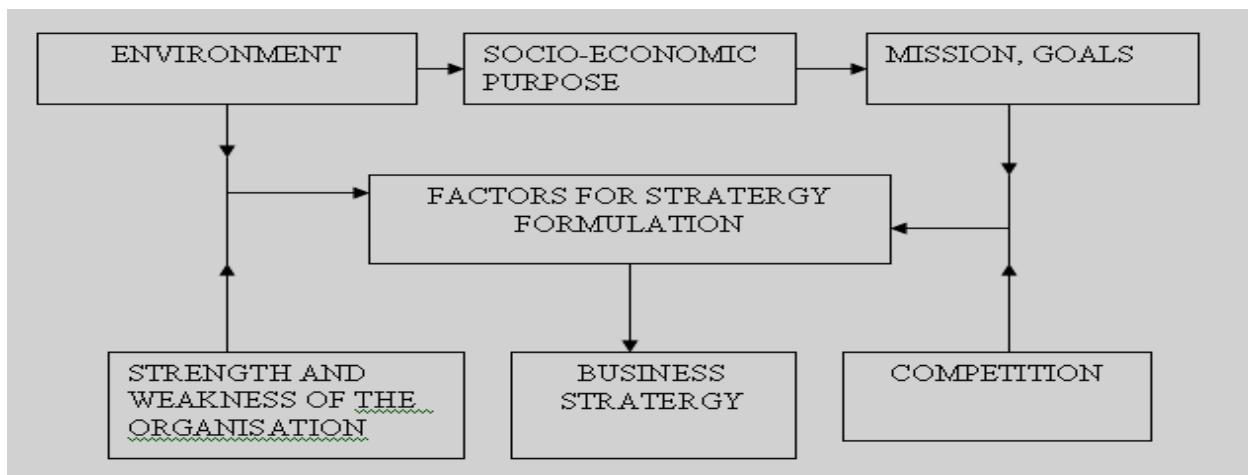
Fig.9.3. Strategy Formulation Model

9.9. SUMMARY:

This unit describes the importance of planning and its types. It also defines strategic planning and the different applications or methods of applying strategies to business application. Short range and long range planning are also discussed along with the tools of the planning. SWOT analysis for identifying the business strengths and weakness of the system along with the implementation strategies have been discussed with the competitive advantages of the management and IT sectors.

9.10. KEY WORDS:

Corporate Planning, SWOT, Implementation strategies, Growth Strategy, Market Strategy, Corporate Strategy, Strategic analysis of business, Change management.

9.11. EXERCISE:

1. What is corporate planning? Why is it necessary? It is long-range or short-range?
2. What is strategic planning? When does it assume importance in the business?

3. Why should companies resort to long-range strategic planning? How is it linked to mission and goals of the company?

4. What are the different types of strategy? Can a business have more than one strategy?

How are different strategies related to each other? Explain with reference to a business of your choice, a growth strategy, marketing strategy, product strategy.

5.Explain the change management. What are the factors that are identified as an important factors for deciding the change management.

6. List out the implementation challenges that are used in the development of MIS planning.

7. Discuss the importance of the SWOT analysis in every sector of the management.

9.12. REFERENCES:

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

3. Management Information systems, Sadagopan, PHI-2002.

UNIT -10: BUSINESS SYSTEM
_____

Structure

_____

10.0. LEARNING OBJECTIVES:

_____

- Identify the approaches to MIS development

- Understand the Implementation of MIS

- Identifying the development process of MIS

- Understanding the importance of Client Server architecture

- Detail study of implementation steps

- Analyze the importance of technology in building MIS

10.1. DEVELOPING BUSINESS SYSTEM:

Having made the plan of the MIS, the development of the MIS calls for determining the strategy of development. As discussed earlier the plan consists of various systems and subsystems. The development strategy determines where to begin and in what sequence the development can take place with the sole objective of assuring the information support. The choice of the system or the subsystem depends on its position in the total MIS plan, the size of the system, the user understands of the system and the complexity and its interface with other systems. The designer first develops systems independently and starts integrating them with other systems, enlarging the system scope and meeting the varying information needs. Determining the position of the system in the MIS is easy. The real problem is the degree of structure, and formalization in the system and procedures which determine the timing and duration of development of the system. Higher the degree of structuredness and formalization, greater is the stabilization of the rules, the procedures, decision making and the understanding of the overall business activity. Here, it is observed that the users and the designers interaction is smooth, and each others needs are clearly understood and respected mutually. The development becomes approach with certainty in inputs process and outputs.

10.2. SYSTEM DEVELOPMENT LIFE CYCLE APPROACH:

There are many systems or subsystems in the MIS which have a life cycle, that is, they have birth and death. Their emergence may be a sudden or may be a part of the business need, and they are very much structured and rule-based. They have hundred percent clarity of inputs and their sources, a definite set of outputs in terms of the contents and formats. These details more or less remain static from the day the system emerges and remains in that static mode for a long time. Minor modifications or changes do occur but they are not significant in terms of handling either by the designer or the users of the system. Such system, therefore, have a life and they can be developed in a systematic manner, and can be reviewed after a year or two, for significant

modification, if any. Examples of such systems are pay roll, share accounting, basis financial accounting, finished goods accounting and dispatching, order processing, and so on.

These systems have a fairly long duration of survival and they contribute in a big way as sources of data to the Corporate MIS. Therefore, their role is important and needs to be designed from the view point as an interface to the Corporate MIS. The life cycle approach, therefore, has a method of its own as explained in the fig. 10.1. Apart from the core systems, some decision support systems can be developed through the life cycle approach. The choice of system design in the prototype and Life Cycle approach is decided on the basis of the nature of the system or application.

.
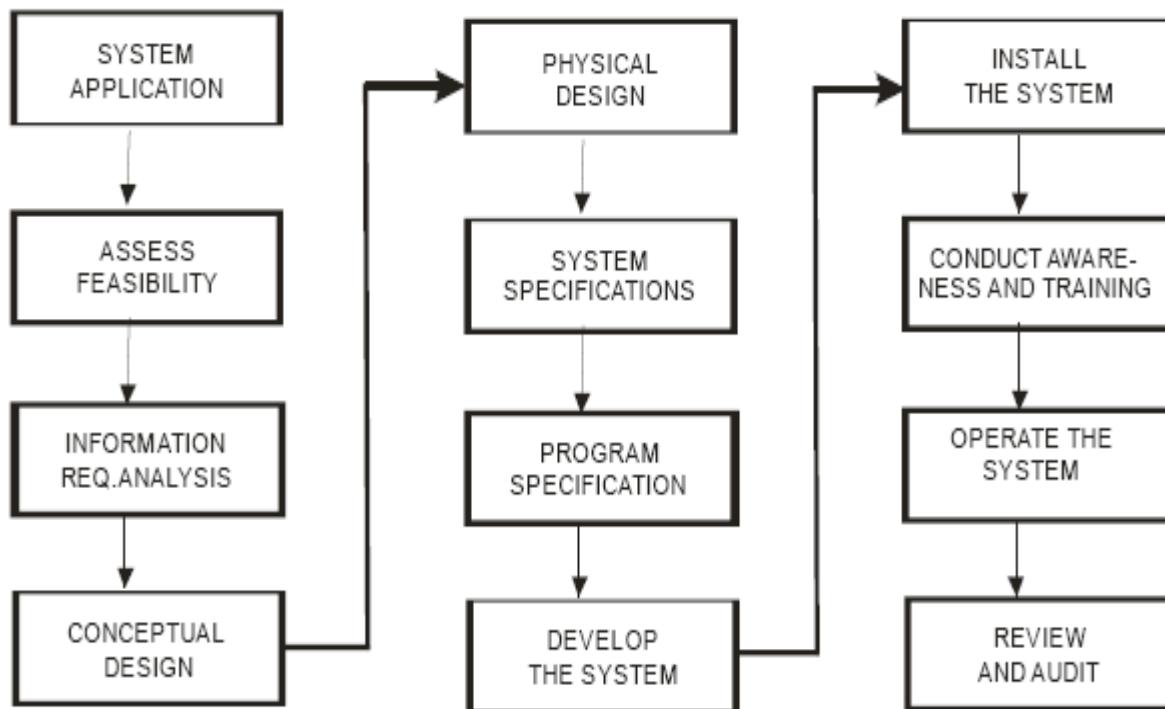
Fig. 10.1 Life Cycle Approach to the Development of MIS

10.3. PROTOTYPE APPROACH:

When the system is complex, the development strategy is Prototyping of the system. Prototyping is a process of progressively ascertaining the information needs, developing methodology, trying

it out on a smaller scale with respect to the data and the complexity, ensuring that it satisfies the needs of the users, and assess the problems of development and implementation.

This process, therefore, identifies the problem areas, inadequacies in the prototype vis-à- vis fulfillment of the information needs. The designer then takes steps to remove the inadequacies. This may call upon changing the prototype of the system, questioning the information needs, streamlining the operational systems and procedures and more user interaction. A typical process of the system development through prototyping is given in fig. 10.2.
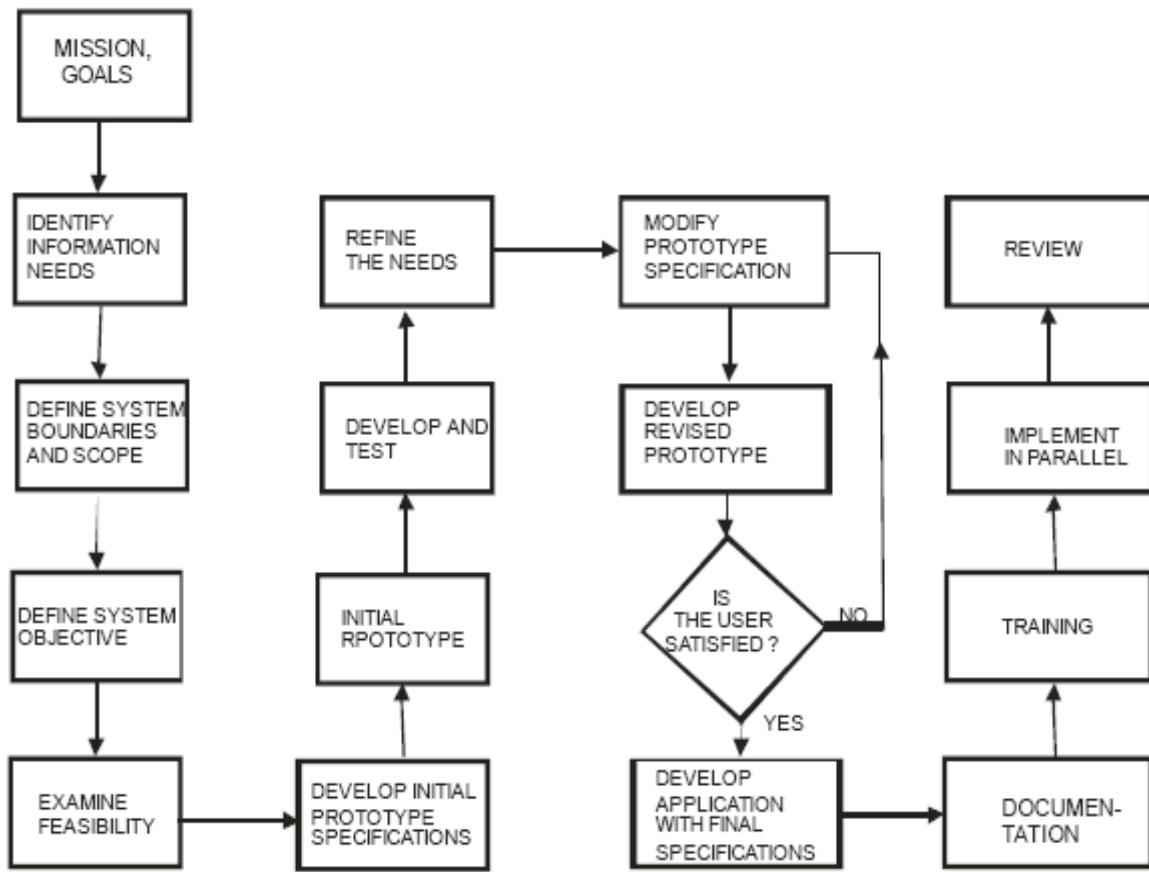
Fig.10.2. Prototype Approach to the Development of MIS

In the prototyping approach, the designer's task becomes difficult, when there are multiple users of the same system and the inputs they use are used by some other users as well. For example, a lot of input data comes from the purchase department, which is used in accounts and inventory management. The attitudes of the various users and their role as the originators of the data need to be developed with a high degree of positivism. It requires, of all the personnel, to appreciate

that the information is a corporate resource, and all have to contribute as per the designated role by the designer to fulfill the corporate information needs. When it comes to information the functional, the departmental, the personal boundaries do not exist. These calls upon each individual to comply with the design needs and provide without fail the necessary data inputs whenever required as per the specification discussed and finalized by the designer. Brining the multiple users on the same platform and changing their attitudes towards information, as a corporate resource, is the managerial task of the system designer. The qualification, experience, knowledge, the state of art, and an understanding of the corporate business, helps considerably, in overcoming the problem of changing the attitudes of the multiple users and the originators of the data.

_____

10.4. SYSTEM DEVELOPMENT PROCESS:

_____

A schedule is made for the development of the system. While preparing the schedule due consideration is given to the importance of the system in the overall information requirement. Due regard is also given to logical system development. For example, it is necessary to develop the accounting system first and then the analysis. Further, unless the systems are fully developed their integration is not possible. This development schedule is to be weighed against the time scale for achieving a certain information requirement linked to a business plan. If these are not fully met, it is necessary to revise the time schedule and also the development schedule, whenever necessary.

Hardware and software plan

Giving due regard to the technical and operational feasibility, the economics of investment is worked out. Then the plan of procurement is made after selecting the hardware and software. One can take the phased approach of investment starting from the lower configuration of hardware going over to higher as development takes place. The process is to match the technical decision with the financial decision. The system development schedule is linked with the information requirement which in turn, is linked with the goals and objectives of the business.

The selection of the architecture, the approach to the information system development and the choice of hardware and software are the strategic decision in the design and development of the MIS in the organization. The organizations which do not care to take proper decisions in these areas suffer from over-investment, under-utilization and are not able to meet the critical information requirement. A model of MIS plan is given in table 10.1.

It is important to note the following points:

1. The organizations strategic plan should be the basis for the MIS strategic plan

2. The information system development schedule should match with the implementation schedule of the business plan.

3. The choice of information technology is a strategic business decision and not a financial decision.

Table 10.1. MIS plan requirements

Contents	Particulars	Focus
Corporate information	Business environment and current operation.	Where are we ?
Corporate philosophy	Policy, guidelines, culture.	What is the foundation of business ?
Corporate mission/goals/objectives	Current and new mission/goals/objectives.	Where do we want to reach ?
Business risk and rewards	Clear quantitative statements on these factors showing a trade off between the risk and rewards.	What is the risk ? is it worth the risk ?
Business policy and strategy	Details of the strategic and policy decisions affecting the business.	How do we achieve the goals and objectives ?
Information needs	Strategic/planning, operational	What is the key in formation?
Architecture of the plan	Information Technology details.	What are the tools for achievement?
Schedule of development	Details of the systems and subsystems and their linkages charted against the time scales.	When and how will it be achieved?
Organization of the plan	Manpower and delegation details. Internal and external resources.	Who will achieve it ?
Budget	Details on the investment schedule and benefits.	How much will it cost ?

10.5. IMPLEMENTING BUSINESS SYSTEM:

The implementation of the system is a management process. It bring about organizational changes, it affects people and change their work style. The process evokes a behavior Response which could be either favorable or unfavorable depending upon the strategy of the system implementation. In the process of implementation, the system designer acts as a change agent or a catalyst. For a successful implementation he has to handle the human factors carefully. The user of the system has a certain fear complex when a certain cultural work change is occurring. The first system has foremost fear is about the security to the change-over form the old to new is not a smooth one. Care has to be taken to assure the user that such fears are baseless and the responsibility, therefore, rests with the designer. The second fear is about the role played by the person in person in the organization and how the change affects him. On many occasions, the role may reduce his importance in the organization, the work design may make the new job impersonal, and a fear complex may get reinforced that the career prospects may be affected.

There are certain guidelines for the systems designer for successful implementation of the system. The system designer should;

1. Not to question beyond the limit of the information, need to the user.

2. Not to forget that his role is to offer a service and not to demand terms.

3. Remember that the system design is for the use of the user and it is not the designers prerogative to dictate the design features. In short, the designer should respect the demands of the user.

4. Not mix up technical needs with the information needs. He should try to develop suitable design with appropriate technology to meet the information needs. The designer should not recommend modifications of the needs, unless technically infeasible.

5. Impress upon the user the global nature of the system design which is required to meet the current and prospective information need.

6. Not challenge the application of the information in decision making. It is the sole right of the user to use the information the way he thinks proper.

7. Impress upon the user that the quality of information depends on the quality of input which he provides.

8. Impress upon the user that he is one of the users in the organization and that the information is a corporate resource and he is expected to contribute to the development of the MIS.

9. Ensure that the user makes commitment to all the requirements of the system design specifications. Ensure that he appreciates that his commitments contribute largely to the quality of the information and successful implementation of the system.

10. Ensure that the overall system effort has the managements acceptance.

11. Enlist the users participation from time to time, so that he is emotionally involved in the process of development.

12. Realize that through serving the user, he is his best guide on the complex path of development.

13. Not expect perfect understanding and knowledge from the user as he may the user of a non-computerized system. Hence, the designer should be prepared to change the system specifications or even the design during the course of development.

14. Impress upon the user that the change, which is easily possible in manual system, is not that easy in the computer system as it calls for changes in the programs.

15. Impress upon the user that perfect information is non-existent; his role therefore still has an importance in the organization.

16. Ensure that the problems in the organization are resolved first before the system is taken for development.

17. Conduct a periodical user meeting on systems where you get the opportunity to know the ongoing difficulties of the users.

18. Train the user in computer appreciation and systems analysis as his perception of the computerized information system will fall short of the designers expectation.

10.6. CLIENT SERVER ARCHITECTURE:

The need to access right information at the right time by its user is increasing at a rapid pace. With the business environment become competitive and cost of business processing increasing rapidly, the managers of the business need flexible, dynamic, simple-to-use, technology friendly information system to meet their business need. Big business operations have multiple locations and multiple businesses and because of data generation, acquisition and maintenance become a

technological challenge. To contain cost of running the business and to improve the services to the customer, the managers developed variety strategies.

The computing technology of the seventies supported centralized processing with mainframe computing. in this period data and transaction were brought to a central place, processed in batch mode and the resultant information was delivered at fixed intervals in pre-determined form and content. in this period computing, storage and communication technologies were grossly inadequate to take a care of dynamically changing needs of business information.

On analysis of the needs it was found that what was needed is the capability to separate data from its usage or application. It was found that data entities are same but their need to be processed differently in different situation, it was a case when a situation demands more data from different sources. The user of information also wanted freedom of option to choose information and its processing. In the wake of such requirements, large data volumes   and transactions required speedier processing to deliver the desired information. Mainframe, host based computing technologies did not serve these needs satisfactorily.

With downsizing of mainframes, increased CPU power and data storage capabilities this problem was overcome to a limited extent by resorting to distributed processing. In distributing processing hardware-software distributed at various location and further data is distributed where it is required most. The approach was to bring the data and the application closer to the user, reducing dependence on centralized authority.

The networking technology coupled with personal computer (PC) becoming powerful, user found great relief in meeting their needs. The proximity to data is no more an issue because of networking capabilities. The PCs being powerful in all requirements, user could think of processing data as he feels rite at a particular point. In this period first time the need was felt that data, transaction and application should be logically separated and place appropriate hardware locations for quick access and usage.

The managers of the business are always looking for an environment where communication, coordination and collaboration between individuals carrying out their tasks and responsibilities is easily possible in the shortest possible time. The environment should have capability of offering autonomy and independence to the use without disturbing the data. Information security and integrity , and independence to the development remaining undisturbed. This required certain

characteristics in the processing environment. The data and its processing should be platform independent, so that once application is developed it could be used on new hardware-software platform. In order to take care of the application changes to meet new needs, it is necessary that application structure should be such that it is divisible and distributable in best suited hardware-software platform and also accessible from user locations.

Application logic so build should be reusable at a number of places, expandable at new locations and then the change should affect the smallest portion of the application build and so on. The design and architecture if the application logic should be such that is can communicate with other application and it can be interfaced tightly with other applications.

This required great amount of standardized approach to the application development and in-depth thinking is choosing hardware, software, its configuration and its placement. The business environment and its infrastructure application must be in sync to produce efficient and effective information processing environment.

This requirement to the business puts certain demands on the architecture of information processing system. The demands are as follows:-

1. Data, business rules and usage should be independent.
2. Data, and database should be distributable with controlled access from any point.
3. Choice of hardware and software should be such that its application independent.
4. The processing platform should be easily scalable with no need to change the development.
5. The architecture of the hardware should be scalable to each to meet the budget constraints meeting on going changing user needs.
6. The application designed should be such that it follows standard of coding, presentation and storage giving same look and feel in all application to all user.
7. Data and hardware resources should be sharable.
8. Its platform should remain same even if the organization is restructuring, down sized protecting the investment and development.

The system architecture from sixties to eighties was grossly inadequate , inefficient and incapable to handle business requirement. This was mainly due to technology incompetence and this was overcome in nineties. The technology in all walks of business has become very efficient to handle these requirements. The technologies of computing, storing, programming, processing, communicating and presenting the processed result are so advanced that one can build a new architecture called as **client server.**

Client server architecture (CSA) is a distributed, cooperative, processing environment whereby the entire task of processing is divided in such a manner that there is a demand on the system through a client and there is server in the system to serve this demand. The architecture has two components, client and server , where client makes a request and the server then processes that request and serves the client by offering the result. The client and server are connected to each other through a network component which handles communication between two.

In CSA, client sits at the front end and the server at the back end. The client represents front end tasks requested by the end users. Their server represents the back end tasks of processing and communicating to the client.

The simple architecture of client-server is where application is broken into two logical divisions, data and its processing logic. While data sits on back end server and its management is done by DBMS and the application processing logic such as validations, application of business rules and computing is placed in a front end client device. Both client and server are essentially computers of varying capacity and capability.

Fig 10.3. depicts a simple client-server configuration as the diagram shows, the client and servers are connected through either LAN or WAN network. The client has its own processing application logic and server has its own processing logic to handle data and its processing.
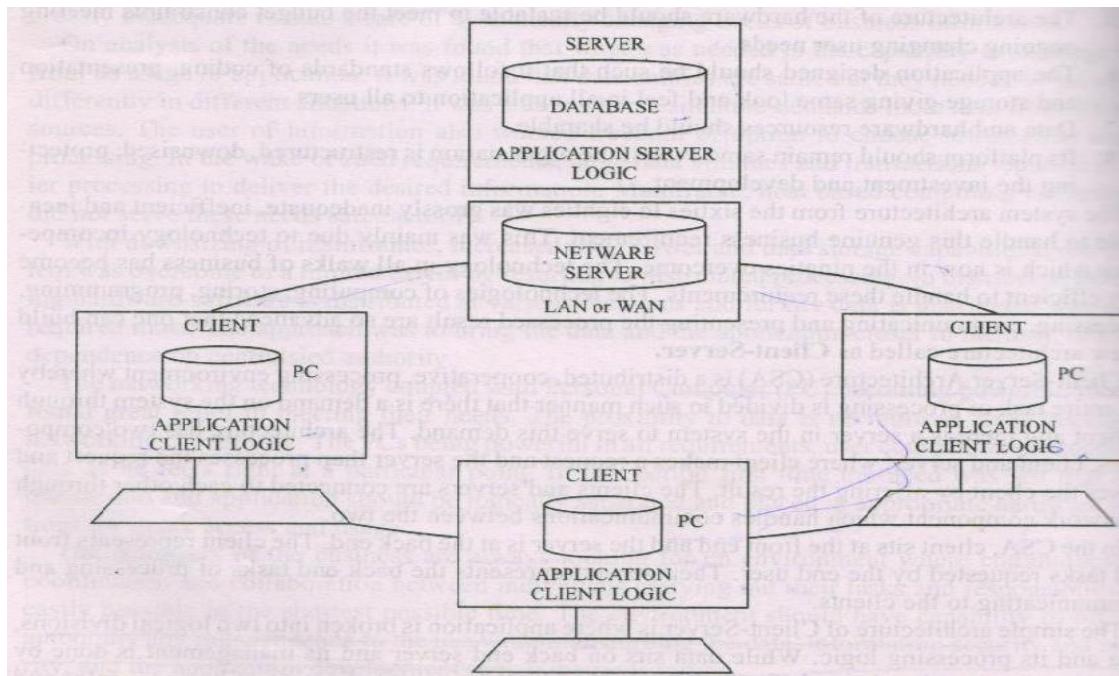
Fig.10.3. Client Server Architecture model

The client handles server independent tasks through its stored application logic and server handles client's request which are triggered after processing in the client. Hence, true client-server implementation requires, application programs split in such manner that client level processing is done by the client and communicated to server to carry out the rest and offer the feedback to the client with the processed result. Client has end tools to handle the requirement in terms of input, process and presentation Fig 10.4. shows traditional model of the mainframe system.
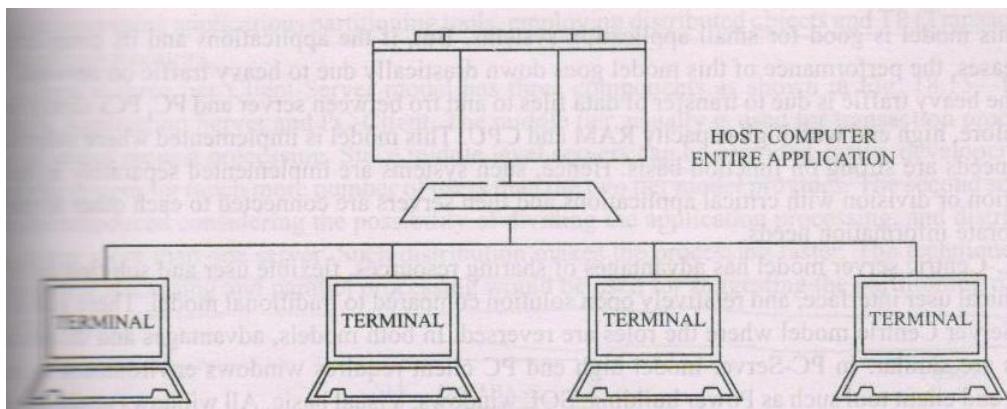
Fig.10.4. Mainframe Model

The traditional model is proven on but suffers from poor response, requires maximum system and maintenance control. It has limited and unappealing user interface and rigid application logic implementation. Since the entire task of processing is handling by mainframe host system, the performance of the whole system on the capacity of host computer system and the load put by its users.

An improved version of the traditional model is shown in Fig 2.5. known as PC-server model. Hence, PC plays the role of client performing under the control of server. In this model architecture, personal computers (PCs) share applications and data resides on one or more servers, this model is called PC centric as processing is done on PC and the results are pushed to the server for update. This was LAN based implementation. Since, PC client request filed from the server and handles all processing within itself, it puts heavy load on the communication links and engages client PC for a very long time.
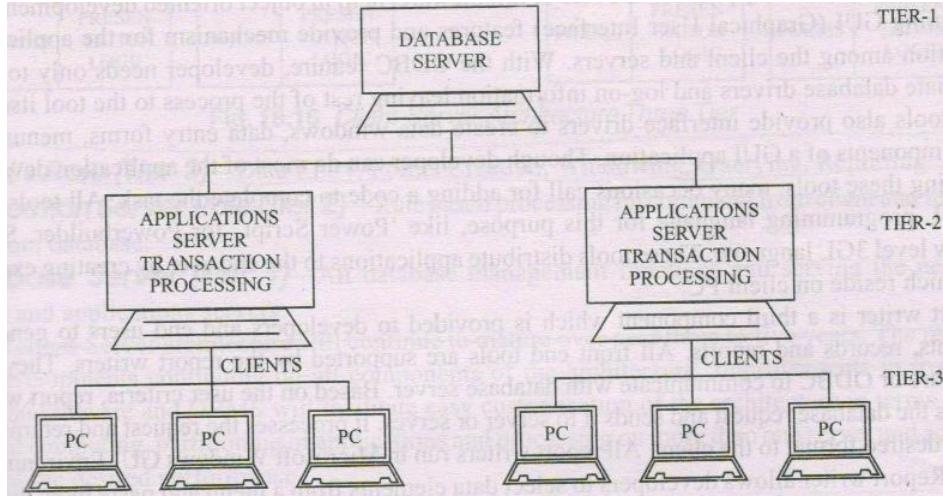
Fig.10.5. Client-Server Three Tier Model: Second Generation

This model is good for small application system. But, if the applications and its complexity increase, the performance of this model goes down drastically due to heavy traffic on network.

The heavy traffic is due to transfer of data files to and fro between server and PC, PCs should be, therefore, high end with high capacity RAM and CPU. This model is implemented where information needs are strong on function basis. Hence, such systems are implemented separately function or division with critical applications and then servers are connected each other to meet corporate information needs.

PC-centric model has advantages of sharing resources, flexible user and solution on PC, graphical user interface, and relatively open solution compared to traditional model. In this model, developer is required to write complex cod in 3GL like 'C' raising the complexity of development and maintenance. With this complexity of both application design and architecture, this modification to the application design and architecture, the modification to the application is time consuming, delayed and occasionally difficult to achieve.

Figure 10.6. shows the three tier client-server model. There are three basic software components of client-server- front end software, middleware and the server software. Front end software includes application development tools and reporting tools, including spreadsheets and word processor. The role of this software is to connect to server, submit the request and receive processed information result. Front end development tools such as power builder, Delphi , visual basic , are widely used, these front end tools support open database (ODBC)features to popular

145

database like Oracle, Sybase , progress , ingress , making these tools DBMS independent.
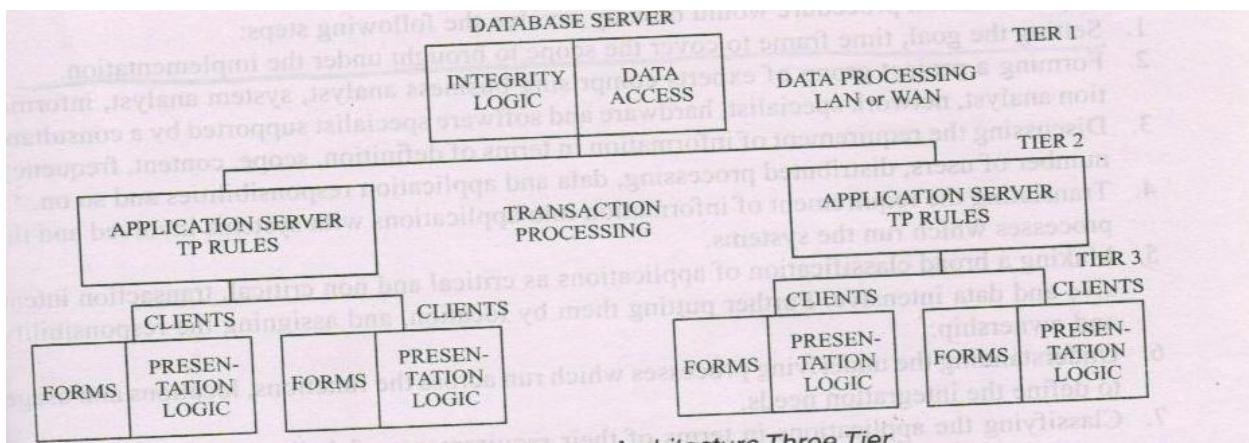
Fig.10.6. Client Server Architecture Three Tier

Reporting tools also link to database server, allowing user to ad-hoc reports and graphs using back end database. These tools provide rapid application developments by allowing users to use prebuilt components of other applications systems which resides in the directory of library.

Middleware is software that sits between the client and the server to facilitate communication. Middleware provides to developers the application processing interface (API) for remote server access. ODBC is an example of middleware which provides open database connectivity. It provides a common interface for the front end software and the server, using common calls.

A typically three tier client-server model has three component as shown in Fig 2.6. - data server , application server and PC-client. The middle tier , usually is used for transaction processing or object request processing . since middle level server can be provided easily, developer can plan the system for much more number of users than the two tier model provides. The second server can be introduced considering the possibility of dividing the application processing to one or more servers such distribution makes the processing faster.

Database server also stores procedure to be used in application when called by client or server. The stored procedure, triggers and rules allow developers to program the database server itself providing another location for application logic. The stored procedure to triggers is a collection of SQL statements and procedure logic. Which can be placed in database server as objects? Client applications can execute these stored procedures or triggers making call on them. the difference between stored procedure and triggers is that the trigger is activated automatically by

146

data-related events that the database server may come across . A role is a special type of trigger which is activated if data is checked for condition and it is satisfied.

Application server is used for application logic processing. Using partitioning tools that processing logic is split into server or between server, and PC client. Essentially it is a place where application are broken into smaller units, known as transactions and the server ensures that they are processed completely in a coordinated manner to produce the application result.

At client level, applications development tools are put to use to develop and execute the application. Some of the popular tools are borland's Delphi, Symantec's visual basic. The basic features of all these tools are that they perform the role of middleware, help in object oriented development, aid in designing GUI features and provide mechanism for the application distribution among the client and servers. With the ODBC feature, developer need only to load appropriate database driven and log-on information leaving rest of the process to the tool itself.

Report writer is a third component which is provided to developers and end user to generate document, record and reports. All front end tools are supported by the report writers. They use middleware or ODBC to communicate with database server. The Report writer allows developers to select data elements from a menu and paste them directly on the report. These tools support application development in three ways, a standalone reports, as embedded objects and as components of an application. Some of them provide a complete development environment with runtime report distribution facility.

In summary second generation Client-Server characteristics are:

- Application logic placement in servers.
- Application partitioning.
- Transaction intensive.
- Scalable from simple to complex environment
- Support multiple platforms
- High order security, testing and maintenance.

Figure 10.6. shows client-server architecture with three tier, each tier having a specific role.

Client's role(tier 3):- Data entry , forms creation , windowing , querying , reporting.

Application server role(tier 2) :- Rule based processing on command from client and fetching data from database.

Database server (tier 1):- All database management function and serving the needs of clients and applications.

10.7. CLIENT-SERVER IMPLEMENTATION STRATEGIES:

_____

The client-server implementation is a customized solution. It is complex to conceive and difficult to plan.The complexity of the implementation is due to following reasons:

- Application mix and load.
- Varying load with different nature of applications such as transaction intensive , database intensive , traffic intensive.
- Organization structure : division , location and information management requirement.
- Hardware – software variety due to application , special and general , requiring coexistence.
- High processing load and data transfer and replication requirements for implementation in multiple location.
- Seamless integration of technical talent , hardware and software with varing configuration.
- Conceiving enterprises wide solution for at least , five years.

The implementation procedure would broadly involve the following steps:

1. Setting the goal , time frame to cover the scope to be brought under the implementation
2. Forming a project grouping of expect comprising business analyst, system analyst , information analyst , network specialist , hardware and software specialist supported by a consultant.

3. Discussing the requirement of information in terms of definition , scope , content , frequency , number of users , distributed processing , data and applications with responsibilities and so on.

4. Translating the requirement of information into applications with systems involved and the processing which run the systems.

5. Making a broad classification of applications as critical and non critical , transaction intensive and data intensive . Further putting them by location , and assigning the responsibility and ownership.
6. Understanding the underlying processes which run across the functions , locations and usage to define the integration needs.

7. Classifying the applications in terms of their requirements of dedicated specialized hardware and software , like CAD/CAM/CAE ,and use of other technologies.

8. Constructing an application grid , system grid to bring clarity of enterprise functioning with mission critical and other applications marked.

9. Deliberating and deciding hardware , software , operating system needs and configuring each of them based on load , nature of load , users , processing needs, nature of processing reporting needs and so on.

10. Making a plan of networking the variety of platforms with infrastructural details namely servers, routers , gateways TCP/IP , NOS and networking strategy LAN/WAN, internet/intranet.

11. Selecting enterprise wide solution comprising ERP solution , dedicated local solutions to meet specific needs , solution on supporting technologies for data capture , transaction capture , data replication and transfer.

12. Deciding on RDBMS, front end tools ,report writers , packaged solutions for text processing , data handling and communication . care should be taken while deciding whether they can coexist and function in a 'cooperative and coordinated manner and in an intelligent way to meet the unified needs of information across the organization.

13. Assessing the needs of hardware and software of all kinds in terms of users , capacity , capabilities and features and most important processing speed in terms of Mhz.

14. Finalizing the numbers of servers, client and hardware components in network with clear role identification as data servers, application servers , dedicated servers and clients.

15. Focusing on long-term requirements and choosing vendors who have clear vision on technology, growth and are committed to serve and support your plans. The products are selected first for its merit and then the vendors who make them.

The client server architecture is a customized structure to achieve total performance. Hence, each component however, small contribution to the performance. Hence its selection is strategic to the success of the system. The choice the number and capabilities are decided by network traffic which may arise due to transaction process, DSS or combination of both every client-server implementation requires fresh scrutiny before it is finalized.

16. Most of the programming is done on the client and selection of the appropriate development too is very important. The choice of tool should largely be based on the features it offers, in comparison with the features required by the applications.

17. Client-server implementation and their roles are changed based on the individuals requirements.It is therefore, strategic to assess manpower resources to manage server, network and client operation. A through training is essential to each of them to

understand the working of the system and their role in it. A team of experts headed by a system administrator should support and maintain the system.

18. Long – term planning, with phased implementation to protect investment and then to ensure the best technology, is critical to the success of client-server implementation. Information technology, business and the information requirements change continuously to an extent that obsolescence cannot be ruled out. Hence, architecture plan must be long term, investment in hardware and software should be adequate to meet present needs and some of the future as well. Investment in the application software should be slightly long term. This approach provides flexibility to change and protect investment and gives highest price performance in a given situation.

19. Ideally after planning a pilot project should be chosen to confirm variety of decisions involved in client-server implementation. If pilot project proves efficient, the decision on large scale is implemented.

20. A typical client-server projected implementation would take two to three years to establish and to evaluate its performance.

10.8. SUMMARY :

This unit provides a brief introduction to the development of business models. This unit also explains about different system development approaches namely life cycle, prototype approaches to build efficient MIS system. As a new technology concept client Server Architecture is discussed in details with their implementation strategies with the idea of updating the existing approaches in a better ways to build an efficient and simplest system approach to MIS.

10.9. KEY WORDS:

System development approaches, Life cycle, Prototype, Client Server, Implementation strategies.

10.10. EXERCISE:

1.What problems does the system analyst face in ascertaining the information requirement at the various levels of management? How are these problems tackled?

2. When should the analyst resort to prototype experimentation for judging the requirement? How is modeling used in this approach?

3. When would you resort to prototype approach and when would you resort to the life cycle approach in the development of the MIS?

4. Explain the Client server architecture, highlighting the different changes that took from I tire to III tier architecture of the client server system.

5. Explain the implementation strategies of Client server system. Identify the complex strategy that is involved in building the client server system.

10.11. REFERENCES:

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

UNIT -11: E-BUSINESS TECHNOLOGY

Structure

11.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Define Re-engineering of the process
- Understand different E-business models
- Differentiate between internet and intranet
- Analyze Web strategic management

11.1. INTRODUCTION TO E-BUSINESS :

One of the significant developments in the last decade of 20th century was emergence and convergence of number of technologies, affecting the business in the style, culture and the process of its execution. The four prominent technologies are 1.Networking 2.Communication 3.Internet and 4.Computing.

The E-business using these technologies changed the business scenario. The business suddenly moved from regional to global land because of capital and labor to knowledge.

"**E-business essentially means carrying out the business using electronic methods for business process".** E-methods using tools and technologies enable every process to run with greater speed, and precision in an automated manner, where decision making embedded in the process itself. The E-methods transform the business form the business human driven to information driven where people play a role 0 knowledge worker.

In E-business, discontinuity of process marked with delays, online waiting and storage is eliminated through online integration of customers, partner's suppliers and employees. It allows information sharing bringing transparency in business management processes. In   E-business you may be anywhere in world, but you are close to your business location, as access to information is possible from anywhere. In E-business you are like a mobile office available to anybody through electronic reach. In E-business you can access information, view it, download it for processing and upload it again for sharing with others.

The biggest beneficiary of E-business is the customer, who has access to information about the products and services and order it from any supplier located in any country. He has a wide choice to select the customer. The customer has to become knowledgeable forcing the business to become customer centric.

The second beneficiary of E-business is the supplier or vendor who gets access to information on inventory , schedules , order status , etc. enabling to manage resources effectively to meet customer's ,real time needs of raw material or services trusted vendors can become business partners without investing in customer's business when business transformed to E-business .

In E-business environment, employees are empowered with intelligent support of   DSS information making them more efficient and less expensive . They have access to distributed information from internal and external sources. The information is current , accurate and available online to make business decisions their role has become more intelligent and responsive. The role of every employee is upgraded as it is possible to play higher roles in organization hierarchy. The work becomes collaborative due to use of work flow and work group

technologies. The systems and applications have undergone architectural change , making them shorter in time , less resource hungry and faster in response.

The first visible impact is that the business process becomes paperless the messaging ordering receiving and issuing is made electronically making business operation dramatically efficient and significantly less expensive. Any operation like order processing scheduling and manufacturing delivery billing payment, etc. is executed in a paperless way by coordinating number of activities across the organization and outside through information sharing messaging and electronic transaction processing .

In E-business organization structure crosses the boundaries of corporate structure. Through electronic channels of communication your key business partners become logically part of your structure empowered by secured access to the relevant information in terms of business and corporate law, they may be separate legal entities but when it comes to business relation they are part of the organization. In E-business environment vendor , employees , transporter work for common goal of ordered fulfillment as promised by the organization.

The business benefit the management gets with E-business phenomenal they have access to information on latest business status, be it order, deliveries, billing, receivables, lost orders, performance in terms of yield   profitability, cost and so on. Since, information support is accurate, they can watch the competitive position of the business vis a vis immediate competitors. The management is able to collect and analyze customer information, which throws light on pattern and trends in business forewarning the need of appropriate strategy implementation. Following are the characteristics of E-business:

- One Global order management system.
- Global database , single or distributed.
- Paperless transaction.
- Customers select , configure the needs and enter their own orders.
- Suppliers manage you inventory.
- Dynamic order status – received, delivered and order balance.
- Collaborative working through group-ware technology.
- Organization works for 365 days, 24 hours a day.
- Business relationship with customers, vendor and business partner gets transformed to trust relation.
- Employees become knowledge based intelligent workers.

- A management and operations overhead shows decline over a period of time.
- E-business initiatives are triggered through four driving factors as shown in Fig 3.1.

The factors are

- Cost of business operations
- Customer response time
- Management overheads
- Competition leveraging on technology

The key indicators, which manifest poor business performance calling for E-business initiative, are the following.

1. Longer processing cycles
2. High inventory at all location
3. Employees spending too much time in searching and accessing information
4. Critical resources idle
5. Rapid loss of market share
6. Market shares of loyal customers on the decline

E-business uses different technologies to transfer conventional business methods to E-enabled methods. It begins with intranet for in-company seamless integration of systems, it uses web enabled systems to deal with text based information. Along with supply chain management systems(SCM), customer relations management system(CRM) are implemented. Intranet then is extended to trusted business partners with complete security measure to protect information from exposure to unauthorized people.

A business organization would manage its information needs in E-business environment as shown in fig 11.1.
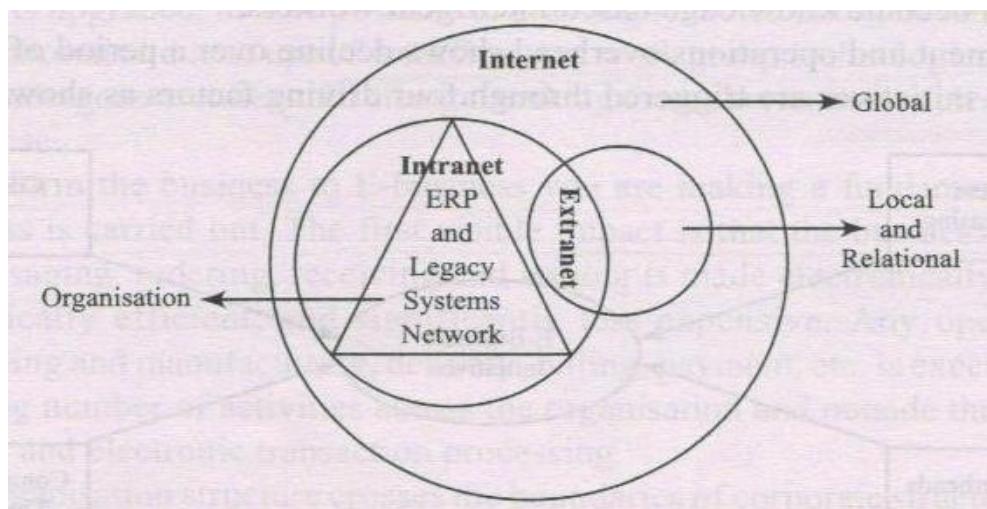
Fig.11.1. E-business Infrastructure

E-business requires hardware and software properly chosen and installed along with other technologies. the basic requirements are as shown

Hardware   Software

Server(s)   --------   ERP/CRM, group ware++,VB

Client(s)   ---------   Middle ware , software

Modem(s)   ---------   HTML , HTTP

Network   ---------   web browser, web server, java script , pearl, NT,

                                 UNIX,TCP/IP,windows

The technologies E-Business requires are communication, intranet/internet, web, EDI , work group, video conferencing and multimedia.

_____

11.2. MODEL OF E-BUSINESS:

_____

Models of E-business functions through four business models. The models are

- Business to business(B2B)
- Business to customer(B2C)
- Customer to business(C2B)
- Customer to customer(C2C)

In B2B model, the participants in E-business are two organizations with relations as buyer seller distributor – dealer and so on . Hence the participants are two business entities.

The E-business applications in B2B are of two types. One of information sharing and second of transaction processing.

Information delivery applications:

- Issuing business circular
- Product catalogues publications
- News clippings

Transaction processing applications:

- Messaging
- Order processing

- Order execution

- Payment processing

- Money-transfer

In B2C model, the participants in E-business are on organization and customer as in individual the customer is an individual customer or employee. The E-business applications in B2C are the following:

Information sharing application;

- Organization manual

- Database of knowledge

- Business information

Transaction processing application

- Service offers/contracts

- Payment to employee

- Issue of shares/bonds

- Delivery through courier

In C2B , the customer / consumer deals with business organization in individual capacity.

Information sharing application

- Downloading of information

- Viewing the bank balance

- Seeing manual / drawing / pictures / images , etc

Transaction processing

- Requesting an item

- Obtaining travel advance

- Inquiry processing

- Credit card payments

In C2C both the parties are individuals and play the role of buyer / seller as the case may be .

Information delivery application

- Messaging – Email

- Reports

- News groups

Transaction processing

- Payment approvals

- Memos

- Sanctions and confirmations

- Issues and receipts

The information-sharing application is built on back end systems. Which collect data and process it to create information databases? The users of these databases could be organization or individuals in the capacity of buyer or seller. The participants have authorized access to information and have rights to read, write or use it in any of the application.

In transaction processing applications participants draw the information, use the business rules and implements a process to achieve the results . in transaction processing , information or material is transacted using electronic methods . the processing order , delivery , shares issues , receipts approvals , etc. are transacted through electronic process using information and business rules . in transaction processing , there is a well defined input taken to produce predefined output using business rules satisfying certain condition.

In more specific terms , ERP/supply chain management is a typical B2B model where information is shared and business is transacted between two organizations. The organization could be manufacturer and vendor , manufacturer and courier service partner , manufacturer and bank, manufacturer and dealer or distributor. The business relationship of these two partner is formal and is built on trust and confidence . Hence, information is shared with confidence and business is transacted on the basis of agreed rules and regulations. In B2B model, procurement, inventory distribution and payments are managed using E-business technology.

In B2C , messaging and information downloading for use is a big application is inter organization communication application, like news bulletin , communicating change of rules, announcements , price revision are very common in B2C.

Crediting interest on fixed deposit, dividend on shares, refund of unused share amount are applications which fall in the domain of B2C, where partner 'C' an individual in B2C model is outside the organization.

In C2B model , customer interact with information databases such as product catalogues , price information , configure the product , compare the cost , place the order and have it delivery after

electronic payment process. The products like computer book , CDs , music systems and different services are purchased through E-business applications.

In C2C model , E-business revolves around two individuals who deal with each other in their individual capacities and play a designated role as buyer/seller , teacher/student , manager/officer, brother/sister . E-mailing , sending E-greeting , payments, ordering and sending gifts are the C2C model applications.

In all models basic business and communication process are executed through electronic documents. Table 11.1 below shows examples of the E-documents;

Table 11.1.:Information Vs E-documents:

Information	E-document
Product information brochures	Product catalogue document database
Order on paper	Electronic order
Confirmation order	E-mail
Payment cheque	Electronic cash , credit card, E-cheque.

All transaction are paperless hence, confirmations, approvals , signatures are electronically carried out and party is informed through E-communications.

The organizations, which are in E-business in a big way, are listed in table 11.2.

Table 11.2. E-business Organization and website

Service	Organization/website	E-B model
Internet banking	ICICI	B2C
	www.icicis.com	
	HDFC	C2B
Complete business cycle	BHPUL	B2B
	www.bhpul.com	

	dalmia industries	B2B
Billing	www.dalmiaindustries.com	
Bill payments	Citibank	B2C
	ICICI	B2B and C2B
News sharing	www.Billjunction.com	
	time of india	B2C
Tendering	www.timesofindia.com	
	Guj.Refineries	B2B
Greetings/messaging	www.gujrefin.com	
	Through ISP	C2C
Buying	VSNL,MTNL	
	Satyam infoway	C2B
Selling	www.satyaminfoway.com	
	Gloster cables Ltd.	B2B
Information sharing	www.glostercables.com	
	IT space	B2B
Servicing	www.inspace.com	B2C
Configuring and complete	LG LTD	B2C
	IBM Dell/LG	C2B
Business cycle		

IT should be noted that B2B business models actually run with the help of B2C , C2B and C2C models. These models work under the umbrella of B2B . The execution process using these models is assisted by portals, Websites , E-mail, web directories. Internet service provider (ISP) . each organization in E-business environment has its website and Email address and they are linked from portals , which provide basic information.

In E-business models , we have considered two parties who engage in business to perform these activities .Certain intermediaries are required to handle these activitieis. The intermediaries are:

Hardware suppliers : servers , clients , routers and network card providers

- Network access providers :ISP ,EDI , DoT
- Information access providers : browsers such as Netscape , Adobe and internet Explorer.
- Payment Processors: First virtual , digi cash , visa ,master card.
- Web site design providers :consultants and web developing companies
- Web directory providers : Yahoo , alta Vista ,lycos.

E-business models are developed using these intermediaries . the components of E-business models are:

- Intranet/extranet (internal communication)
- Internet (external communication)
- Network and TCP/IP protocol and tools(delivery mechanism)
- Web server and web browsers software (access , process and download and send)
- Back end system(application processes)

The persons driving E-business model other than users are the following:

- Web master
- Web designer
- Web development programmer
- Content providers
- Content designers
- Web administrator

Web master controls the website inflow/outflow information, content management and regulation of the traffic. The role is similar to DBA in RDBMS environment. Web designer conceptualizes and visualizes the requirement of the parties and creates a web design which is attractive , useful and easy to handle.

Web developer /programmer/designer writes web pages using HTML, DHTML ,XML, CGI scripts and other tools . They are also involved in program writing interface for connectivity to other databases and to back end ERP or legacy systems.

The content providers are responsible to create text , images and a multimedia input to the sites . These people are subject experts and key people in making a site a grand success. The content designers give site layout , placement of icons, positioning and display ideas to deliver the content to the site viewers immediately. They provide input in terms of aesthetics , colors , navigating through different information layers etc.

The content designers are responsible for the organizing the contents in a systematic manner such that the contents that are presented is flexible and in readable format, such that the person who reads it, they should be able to get the contents.

Web administrator maintains the web site. He is a trouble shooter, in case of any problem. He is the first contact point for users, viewers to solve their difficulties. He is responsive to make viewer analysis in terms of his visits to site, areas visited and business generated.

11.3. INTERNET AND WORLD WIDE WEB:

The internet is a global network of computer, working as servers or clients to exchange information. The internet is distributed over homes , business , schools and government offices all over the world. Millions of computers of different types- PC s , Macintoshes , minis and others are connected in through network.

Any types of computer from palmtop, PC to super computer loaded with TCP/IP protocol becomes automatically a member of the internet. It uses wide range of communications media. The "wire" that interconnects millions of computer on the internet includes local area network , private data lines, local telephone network carrying signals via wire, microwave and satellite and international telephone couriers. The internet is a single network which exchanges information from anywhere to anywhere because it is platform independent due to TCP/IP and communication technology independent. Internet is a network of clients and servers. The servers may be , dedicated or general , performing dedicated functions or serving general requirements. Variety of components is used in the design of internet. They are discussed as below.

Hardware and software of internet:

Variety of hardware and software is used to make the internet functional and effective. Number of people and agencies are involved in internet working,

Modem:

Modem is a device that enables two computers to communicate with one another through phone lines. When you open an internet account and use it , you are using modem installed at your location to communicate through modem installed at internet service provider (ISP) , VSNL , MTNL , and many more are he ISPs.

Modem has a speed , which is measured in bits per second(Bps). Higher the Bps faster the modem. Modems are available in the range 9.6 Kbps to 56 Kbps and more than this also.

Computer:

The best PC would be a multimedia PC of 32 MB RAM with very powerful CPU and 4GB onwards disk capacity. For normal E-mail applications standard PC of good speed is adequate.

If your applications requires multimedia capability , PC shall have all multimedia features such as sound card , speakers , PC video camera, etc.

Web TV:

Web TV is a terminal to be attached to your TV. The terminal uses your TV as display and you navigate the internet through the terminal's wireless remote control or an optional wireless key board.

Software:

You need two types of software to enable your PC as an internet PC.

- Communication software to establish the TCP/IP connection to the server.
- Client software for each activity such as browsing , E-mail , news and so on.

when you buy window software the communication software, E-mail , telnet and FTP are provided as bundled software's.

Browser software:

Google chrome and internet explorer are the most popular available in the market. PC vendor gives software of your choice . The features of these two browsers are given in table 11.3.

 With the hardware and software in place, you still need an internet service provider who provide you a gateway to internet. The large ISPs are VSNL, MTNL who have their own gateways. These ISPs , through their partners will provide total service to make your PC an internet PC.

Table 11.3.Features of the browsers

Netscape	Internet explorer
• Navigator for browsing • Messenger for e-mail • Collaboration for news reading • Conference for voice/video meeting • Page composer for webpage publishing	• Browser • Outlook express for E-mail • Net meeting for voice / video conference • Front page express for webpage publishing • Chat

- **Applications of internet:**

Internet is a powerful tool which can be used of number of applications. Major applications are as listed.

Search the web addresses for access through search engine:

If you are interested in knowing some details about PC, you need to know some PC vendor. So your can search on yahoo , alta vista sites, where you will find vendor, PC details, price, etc.

Downloading programs and files:

Internet offers through various websites, programs and data files which can be downloaded on your local PC for use. The downloading could be free or at nominal charges.

E-mail:

Major application of internet is messaging through E-mail . You can receive and send messages to one or more persons. Address book is a built – in features where you can store address required very often.

Mailing list:

You can join a mailing list group where you receive and send messages to interested members of the groups . You send a message and others reply, you with their contribution.

Voice and video conferencing:

Conduct meeting through conferencing where you can hear and see each other.

Chatting;

Conversation capability to speak with experts at predetermined time**.**

Buying and selling on the net:

Through search engine you can find suitable item and vendor to place order, pay the bill and have it delivered to your home.

Webpage publishing:

 You can publish your self through WebPages on the net. With web address known to the users they can visit your homepage and learn more about you.

Applications mentioned here are basic and are very simple to use. Necessary tools are available to start such applications. Internet is a very powerful tool, which puts you to world market at very little cost. Its capabilities when used properly cuts down on costs heavily **.** Major saving being in communication costs and business benefits through saving in business processing cycle across the organization. When you are ready to use internet , you need a connectivity to internet, there are three types of connectivity:

- Dial up (shell account)   home users/single users
- Digital dial up (ISDN)   dedicated connectivity for commercial user
- Leased line   high speed dedicated link. Point to point for
                                commercial users.

The speed and response time when you are on internet depends on bandwidth available for communication and speed of getting connected to ISP server. overall performance of the internet depends on traffic intensity , bandwidth available modem and network efficient of ISP.

World Wide Web (WWW):

 World wide web(WWW), popularly known as web is quite distinct then internet . In simple terms internet is a network spread over the globe not knowing precisely the number of servers and number of clients located in the network. Internet is a carrier of data and information sharing architecture that integrates information stored on network is a global information sharing architecture that integrates information stored on servers.

Web offers software foundation as a standard for navigating, publishing information in the particular format known as web server. Internet holds and delivers the web pages and content stored on pages. Internet runs on TCP/IP protocol which helps to find two computers, introduce,

themselves and they conduct conversation. In simple terms, TCP/IP helps to establish connection between two computers and ensures that data sent from one end is delivered intact at the other intended destination. TCP/IP protocol is a low level protocol dealing with communication. The web protocol (HTMP , HTTP , CGI) deals with format and content of data.

Internet can handle connectivity and web can handle information across the internet . The web serves the following three function:

- As a part of operating system windows/unix/NT.
- As a distribution channels for downloading applications on the operating platform.
- As a middleware between database servers and clients.

The web is a client/server architecture. The information is stored in files on web servers. The information is organized into distributed pages. The pages are stored in HTML format. A page stored in HTML format is called a web page.

The web technology provides mechanism for fetching dynamic information from other sources and make it part of the webpage. For example: home page of a stock exchange will show basic information of stock exchange with a portion showing dynamic share price index and real time changes in the share prices. The mechanism is standard interface called the common gateway interface (CGI) to execute a separate program that fetches the dynamic information format it into HTML, and forwards it to the server for storage and viewing by the client.

Web components:

The following are the different web components used in the design of client server architecture.

Web client browser:

A client mode on the interact has a software called web browser which provides graphical user interface (GUI) for accessing and displaying the webpage. Most widely used browser are Microsoft's internet explorer and netscape's navigator.

Web server:

Web server stores documents and other accessible from web client using web browser. The most widely used web server are microsoft's internet information server and netscape's communications server/enterprise server and Apache server.

HTTP{Hyper-Text Transport Protocol}:

HTTP is language enabling communication between web browser and web server the communications happens in the following way:

- Web browser establishes connection to server
- Web browser then issues instruction to the server to fetch a web page.
- Web server process the instruction and sends the web page to web client
- On receipt and display of the web page browser/server connectivity ends and communication transaction is completed.

URL(Uniform Resource Locator):

URL is a address of the page which is used to find the webpage . URL is used to jump from page to page. URL contains three parts mentioned in the following sequence:

1. Access method   http
2. Computer location   www.domainname.com
3. File location(the last part of URL)   directory path and or a file name.

An example of URL is   http;/.www.abc.org/careers /industry.html

HTML:

 HTML is a hypertext mark-up language used to display the webpage , containing text , graphics, audio , video. HTML contains several categories of tags known as mark-up tags. Mark up tags are as follows:

Title:

A title is generally displayed above the page and is used to identify it on other contexts.

Headings:

 HTML has six levels of headings numbered 1 through 6,. With 1 being most prominent. They are displayed in bolder fonts.

Paragraphs:

 Web pages are made of paragraph and browser handle length of line in paragraph.

Additional markup tags:

A document can have a various kinds if lists unnumbered and numbered which need to be nested. The document can have quotes , addresses and text preformatted with spaces , line borders .HTML provides additional markup tags.

 Character formatting:

 Text may have words , phrases, lines which need to be underlined, italicized. HTML allows formatting words or lines of words as per your choice.

Linkage to other documents(hyper link):

HTML distinctive features is the hyper link, that is link to other page, when you click on the link, it fetches reffered page for display.

Images , graphics and other special features:

HTML includes mechanisms to display non-text content such as graphics , animation, sound and other special files by invoking external program.HTML with these markup tags represents a document containing text, list boxes and graphics audio , video clippings.

_____

11.4. ELECTRONIC IMPACT ON WEB ON STRATEGIC MANAGEMENT:
_____

Internet and web are making phenomenal changes in the management processes of business and industry. The complex cycle of process management, beginning with planning and concluding with execution and control still remains applicable, but it can be executed more efficiently with rich information resource due to internet.

The main objective of the process of management is to increase management effectiveness in business planning and execution. With web access through internet, management effectiveness has considerably increased. Firstly with better information the process has become more efficient. Secondly the control has become more effective due to prompt feedback on business status. The third factor, which has contributed to increase in the management effectiveness, is the speed of communication. With web access, access and communication is possible anywhere, any time and to any location.

Strategic Management under Web:

The management resorts to strategic business planning due to following reasons;

1) Market forces affecting the business performance
2) Changes in technology threatening the business
3) Competition leveraging on technology
4) Complexity of business due to volatility of markets, products and customers
5) Environment offers challenging opportunities for exploitation.

With information available on web, the process of strategic planning has become easier. First, setting realistic business goals and objectives is possible. The goals and objectives could be set in quantitative terms as they are evolved on the basis of facts and figures about the industry and business and technology. Since, goals and objectives are in quantitative terms, it is now possible to measure the progress towards its achievements. The strategic business plan so developed can be monitored and corrected based on online real time information given through web channel. The time gap between knowing success or failure and the reasons for it and response time to react on it, is now very small. It is possible, due to web, to locate the adverse performance or

strategy failure in a short duration through you own network channels and through comparative analysis made by independent third party research and analysis institutions. With information support from web, strategic management of business is now an exercise whose credibility is high and its acceptance is with confidence.

11.5. SUMMARY:
_____

This chapter provides a different view of the entire MIS system. It highlights how the business is conducted through online process. To have an efficient online process, different models have been suggested in this chapter. Also the various components used in the designing process of E-business is discussed. Importance of Internet and the world wide web is also explained in revlevance to the E-business with the impact of strategic management for web.

11.6. KEY WORDS:
_____

  E-business, E-business models, Internet, World Wide Web, Web components, Browser, Hyper Text Markup Language, Strategic management.

_____

11.7. EXERCISE:
_____

1. Explain the different types of E business models.

2. Identify the importance of the on line E-business.

3. Explain the internet and its components

4. Explain world wide web and its web designing components

5.Explain the impact of the web strategic management.

_____

11.8. REFERENCES:

_____

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

UNIT 12: WEB ENABLED MANAGEMENT

12.0. Structure

12.1. Learning objectives

12.2. Intranet and extranet

12.3. Web enabled business management

12.4. MIS in web environment

12.5. Summary

12.6. Key words

12.7. Exercise

12.9. Reference

12.0.Learning Objectives:

- Understanding Intranet and extranet
- Knowing the impact of web in business transactions
- Realizing the importance of web in MIS
- Importance of components for pre and post web operations

12.1.INTRANET AND EXTRANET:

Intranet:

The E-business requires a network platform, which is seamless and allows smooth flow of data and information in any form from any location to any other destination(s). The intranet is essentially an internal company network that uses internet standards, namely HTML(Hyper text mar-up-language),HTTP(Hyper text transfer protocol) and TCP/IP)(Transmission Control Protocol/ Internet protocol). Intranet is meant for users from the organizations. The normal network is able to handle database applications in client/server architecture, the same network when converted as intranet can handle text and multimedia applications. The intranet is not

accessible to the people outside the organization. The intranets are used within the organizations for the following purposes. An example is given in the bracket.

- Access manuals, contracts; Directories(HR manual)
- Post Personal web pages (Executive profiles)
- Access product, customer Data (Product specs)
- Post job offers, Memos (Appointment letters)
- Revision, validation, approval of documents(Registration)
- Access employee database(Salary data)
- Access database(Drawing, pictures)

Intranet adds value in the information of business due to its capability of handling text and multimedia data types. Intranet deals with internal information needs of the people in an organization. It does not give access to external world. Hence, people outside the organization cannot access this information. Intranet is not internet. To explain in simple terms, intranet is private, within the organization while internet is public available for global access requirement. The technologies used in intranet and internet are same. An intranet can be defined by the following definition.

An intranet is a network of set of computer connected through TCP,IP communication protocols that store data in various locations accessed by computers(clients)distributed at various locations. To run intranet, we need one or more server, client workstations and a network connecting servers and clients. TCP/IP software should be present on servers and clients. Web server software should be on server while web browser software should be on clients. Totally to run intranet, four software components are needed. They are TCP, IP, Web server and Web browser.

TCP(Transmission Control Protocol): A protocol helps to send data to any location to any hardware platform. TCP breaks the message into packets, puts them into envelops and sends at receiving and where it gets reassembled as the original message.

IP(Internet Protocol): Every computer on a network, server or client has a unique IP address known as URL(Universal Resource Locator) which is recognized by internet protocol.

Web Server:

- Processes a request from a client
- Acts as a host to add on products, say search engine
- Log all transactions

Web Browser(Clients):

- Send the process request to server

- Interpret HTML codes and convert into a display containing text and graphics.

Hence intranet can be used to create online reports by taking predefined set of reports converting them to HTML documents and store them on the web server. It is also possible to create online reports using report templates. Hence intranet gives report on demand without online reporting system. When a intranet set up is done it means that we have created an internal website.

Extranet:

Extranet is an intranet for outside authorized users using the same internet technology. The outside users are trusted partners of the organization who have access to information of their interest and concern. For example, in auto-industry spare part manufactures have access to inventory database and production schedules used to plan and ship the required spares tofactory locations.

Dealer/distributors have access to product files such as catalogues, products specifications, pictures, images, etc., to answer queries of the customer. When intranet crosses the logical boundary of the organization and provides secured access to selected data and information of the organization, the intranet becomes extranet.

The security in extranet depends on organizations' policy on information management. If you treat your trusted partner like any other normal user of the organization, then security can be ensured through access rights, authentication and certification procedure.

12.2.WEB ENABLED BUSINESS MANAGEMENT:

In web environment the business initiative is passed in the hands of customer. The customer has access to information on sources of product and services, their availability and price to pay. These are very basic for deciding the purchase of products and services. With internet and variety of E-commerce tools, it is possible to execute a secured purchase transaction where selection of the product is possible, payment to genuine parties is ensured and delivery of the item can be tracked till item is delivered to the doorsteps. The process of ordering, payment and

delivery is very fast calling upon management to make sea change in existing conventional and traditional process of business management.

In web environment, system concepts have changed. The systems have become faster in response and delivery. Table 12.1 shows changes in the system concepts and components.

Table 12.1. Changes in the system components;

Systems components	Pre web	Post web
Inputs	Data from paper transactions	Data from Electronic Transactions
	Incidence of error very high Physical transactions are processed in parallel without waiting for management process	Incidence of error very low and controlled Physical transaction is initiated electronically
Process	Length, linear, full of checks, approvals and human centric controls	Short, collaborative and check approvals built into the system
	Mistaken due to isolated information support and mismatch among these sets	Common information base with sharable feature hence no mistakes due to information mismatch
Output	Output of doubtful nature due to low quality of information	Output of high precision due to high quality of information
Feedback	Feedback mechanism is based on measurement of output of doubtful nature Speed to feedback communication is very slow	Feedback mechanism is enabled in the application based on output of high precision Speed of feedback is very high
Control	Most of the cases it is externally trigged based on human response	Control is a build in the process of the application scope of which is very wide due to extranet and internet.

Due to internet and web technology the system scope has wider applications. In pre web era, the players the system were employees, who use to trigger the operation. But web enabled system affect customer databases, vendor dispatch schedules and bank balances simultaneously without involvement of employees. Web enabled systems, therefore call upon system designer to introduce more security checks which were unheard in the pre web system design and development.

Web has opened new avenues of conducting the business, which were not present in pre web era. The concept virtual organization, virtual storefront is a new development in web environment. The web has made E-commerce possible. The web is a platform independent technology, which is not affected by language or location. Web enabled transactions can trigger from anywhere in the world if anyone has internet access and relevant web address to interact. Web based systems are fast, transparent and secured compared to conventional paper based systems of business management.

12.4. MIS IN WEB ENVIRONMENT:

In internet and web environment the traditional role of MIS as a system to generate information for decision making and to meet reporting requirements of the organization has remain unchanged. But in this role, one more dimension is added due to business becoming customer centric. The business in internet and web has changed from push to customer – to pull from the customer. One more function is added into battery of functions, namely customer management or more precisely customer relations management. In information driven business, employees (knowledge workers) become assets and in customer centric business customers become the assets. The business management now concentrates on creating loyal customers and builds strategies to retain them. It is well known that new customers bring revenue and loyal customers bring profit. A new class of systems, called customer relations management (CRM) is now developed to manage customer relations. The standard packages like Sibel, Clarify are widely used. Ultimately MIS is build with customer focus to improve the service based on following applications.

- Order processing management

- Real times services management

- Product configuration management

- Sales force management

- Post sales service management.

12.5. SUMMARY:

This chapter discusses the higher end of the web applications by reviewing the extension of internet and World Wide Web with the intranet and extranet. It also discusses about the importance of the web in the MIS applications. Apart from this also discusses about how the web enabled business management can be done using the intranet and extranet applications. It also discusses the pre and the post web components used when the business is conducted on web.

12.6.KEY WORDS:

Extranet, Intranet, web environment, web environment, post and pre web components.

12.7. EXERCISE:

1. Identify different applications that are web enabled.
2. Explain intranet and Extranet
3. For one specific application explain how the web environment is suitable
4. For an education system explain what are the pre-web and post web components use in the internet.
5. List out the main difference between the intranet and extranet.

12.8. REFERENCES:

1. Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

Module 4

UNIT -13: LIFE CYCLE OF ERP

Structure

13.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Explain ERP as an enterprise
- Define the concept of ERP
- Identify the needs of ERP
- Analyze the Benefits of ERP

13.INTRODUCTION:

In the Electronic Management Systems, the Enterprise Resource Planning (ERP) system plays the role of front running system. The major decision making and its execution takes place through the ERP. It is a system of managing all functions of the business with information support coming through the ERP. It handles the operational systems to run the business and provides the required inputs to planning and control system handled by the middle management. With the internal sources of information and the use of information from the external sources, it provides decision support information for strategic planning and control to the top management. The ERP is supported by various other support systems which manage, independently, the specific requirements and simultaneously provide inputs to the ERP. Hence, it

has a wider and major role to play in the organizations. Its detailed implementation procedure is studied through its life cycle to know is importance and application.

13.1. ERP IMPLEMENTATION LIFE CYCLE

There are no clear separating lines between the implementation phases of the ERP. In many cases one phase will start before the previous phase is complete. Different phases of the ERP implementation are pre-evaluation screening, package evaluation, project planning phase, gap analysis, re-engineering, customization, and implementation team training, testing, going live, end user training, post implementation.

- **Pre-evaluation screening:** There are hundreds of ERP vendors- of all sizes and shapes- all claiming to have the solution that is ideal for the organization.. It is better to limit the number of packages that are evaluated to less than five. Getting help from external consultants and most importantly finding out what package is used by similar companies.

- **Package evaluation:** Important points to be kept in mind while evaluating ERP software include functional fit with the company's business process, degree of integration between the various components of the ERP system, flexibility and scalability, complexity, User friendliness, quick implementation, ability to support multi-site planning and control, Technology- client/ server capabilities , database independence, security. Availability of regular updates, amount of customization required, local support infrastructure, availability of reference sites. Total costs, including cost of license , training , implementation, maintenance, customization and hardware requirements.

- **Project Planning Phase:** The implementation team members are selected and task allocation is done. This phase will decide when to start the project , how to do it and when project is supposed to be Completed.

- **Gap analysis:** This is arguably most crucial phase in the success of the ERP implementation. But very simply, this is the process through which companies create a complete model of where they are now and where they want to be headed. The trick is to design a model , which both anticipates and covers any functional gaps. It has been estimated that even the best ERP package, custom tailored to companies needs meets only 80% of the functional requirements. The remaining 20% of these requirements present a problematic issue for the company's BPO. One of the most affordable, albeit painful, solutions entails altering the business to "fit' the ERP package.

- **Re-engineering:** In this phase that human factors are taken into account.

- **Customization:** The company needs to know which processes have to change in the process of implementation. SAP for instance , has pre configured industry specific templates that can be tweaked for each individual company(Accelerated SAP or ASAP solution) . Sage MAS 500 ERP system provides a set of customization tools which includes a software development kit and customizer.

- **Implementation Team training:** How to implement it. For the company to be self sufficient in running the ERP system, it should have a good in-house team that can handle the various situations. Select employees with the right attitude-people who are willing to change, learn new things and not afraid of technology – and good functional knowledge.

- **Testing:** In this phase we test real case scenarios. The system is configured and now you may come back with extreme case of system overloads, multiple users logging on at the same time with the same query, users entering invalid data , hackers trying to access restricted areas and so on. The test cases must be designed specifically to find weak links in the system and these bugs should be fixed before going live.

- **Going Live:** This is the phase where ERP is made available to the entire organization. On the technical side the work is almost complete: data conversion is done , databases are up and running and on the functional side , the prototype is fully configured and tested and ready to go operational. Once the system is "live" the old system is removed and the new system is used for doing business.

- **End User Training:** on how to use the system. This phase starts much before the system goes live. The participants should be given overall view of the system and how each person's action affect the entire system. In addition to these general topics , each employee is trained on the job or task that he / she is supposed to performance the system goes live.

- **Post implementation (O&M) :** Once the implementation is over the vendors and hired consultants will go. There should be enough employees who are trained to handle the problems that might crop up. There should be people within the company who have the technical process to make the necessary enhancements to the system as and when required. The system must be upgraded as and when new versions or new technologies are introduced. Here , the organization should think in terms of the incremental benefits of the enhancements because with any upgrade or enhancements.

- **ERP implementation** needs to change the way people have been doing things and lots of procedures are introduced for the functioning of ERP. Resistance to ERP implementation is natural because it is human nature to resist change. Making people accept ERP and implementing it is difficult because of the myths surrounding ERP, such as ERP causing additional work and

more documentation. To reap full benefits of the ERP system, it should get project-wide acceptance.ERP project is complex and lengthy project that requires a vast amount of resources (money, personnel, hardware, software, communications network, etc). 'It is do-it –right-the- first-time' kind of project

13.2. IMPLEMENTATION METHODOLOGY:

ERP implementation:

The ERP implementation, generally, follows the waterfall model approach. Once a firm order is received, the implementation begins with kick off meeting between the vendor and the organization in such a meeting the organizational issues are taken care of since it is a long term activity a preliminary meeting is done to start the implementation.

Requirement definition and description (RDD):

Though, initially, the study has been carried out by the vendor, more in depth study is taken up jointly by the vendor and the project in-charge of the organization. In this phase of study the users are contacted for their requirement specification. These requirements may be of the data, information, function, features, processes or reports. It is necessary to understand them to evaluate the ability of the ERP solution to satisfy these requirements. Since, the ERP is designed as a standard package, it often requires change and modifications to suit the requirements of the business. All the ERP packages provide standard features, functions list for all function, these lists are examined vis-à-vis the requirements and new document is prepared called as the deviation RDD. Once the deviation RD is made, it should be approved by the authorized person in the organization. The purpose of such a document is to freeze any requirement to carry out further changes in the package. In the evaluation of standard RDD, two kinds of changes emerge, one major, where the ERP design need to be changed. Such changes are time consuming and the vendor may charge additionally for such requirements fulfillment. Other changes may be minor and may not affect the design of ERP. The minor changes are cosmetic and / or presentation and they are generally at the lower end of the process. The changes are like the field change, the report format modifications, the computing process and so on the advantage of preparing the RDD and a deviation there from in that the users of the ERP get committed to the solution as they have through the standard requirement provision of the ERP and the deviation required in the provision. In this process, the resistance to change is eliminated, due to direct involvement of the users and the decision makers. The another distinct advantage of the RDD and the deviation from the RDD, is that it provides revised specifications clearly to the designer and the developer to bring out the changes

required in the design of the ERP. It also further helps to assess the work load arising out of the changed requirement.

As soon as the new RDD is prepared, the process designers start implementing the changes. The moment the changes are required the processes of design coding, testing, etc., will come into picture for execution. The changes so made, are then tested on a sample data and other steps on unit testing, module testing and system testing for complete integration are taken.

After establishing the requirement definition and description (RDD) and mapping it with the standard RDD of the ERP solution, the DRDD (deviation RDD) is prepared for changes in solution and the implementation steps are given as follows:

1. A user meeting is arranged to explain the ERP and process of implementation.
2. The RDD and the DRDD is explained for understanding and approval by all users.
3. The development resources to carry out the changes in the system, generally, known as customization is provided. The changes could be business specific and customer specific.
4. The DERP (deviation ERP) solution is tested
5. The solution on the recommended platform is loaded.
6. The solution is tested on a sample data of substantial nature.
7. The solution is then demonstrated to the users for their understanding and confirmation.
8. The users are trained to run the solution and resolve the difficulties in operations of the system solution.
9. The change over's from the manual system to the ERP solution are meticulously planned , taking care of the cutoff dates, the opening balances , the data transfer etc.
10. A log book of the system usage is kept to note down the problems, solutions and modifications are carried out to make the solution more efficient and effective.
11. Standard report like check list, ledger, trail balance and sales analysis are taken to confirm the integrity of the ERP solution.
12. The standard documentation of the ERP solution is changed to the changed version of the ERP.
13. The system performance is checked in term of speed, response, etc. and the ERP solution and / or the hardware is tuned for improving the performance of the solution.
14. After three to four months 'working, a review meeting with the user is conducted, taking the support of the log system for the purpose of improvement, confirmation and finalization of the ERP implementation.

Fig. 13.1. shows ERP implementation process model, which most ERP vendors follow. It is a nine steps approach for successful implementation of ERP.
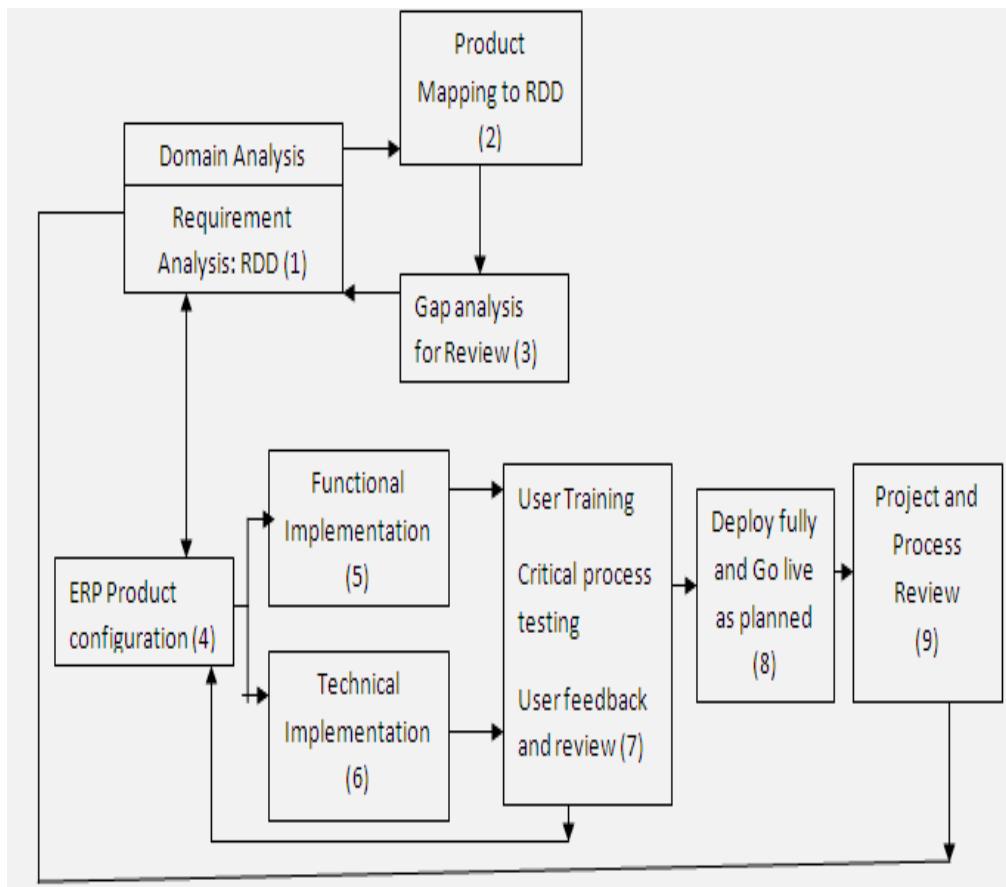
Fig. 13.1. Nine steps Approach to ERP implementation

The above fig shows ERP implementation process model, which most ERP vendors follow. It is a nine steps approach for successful implementation of ERP. The model is built on three reviews first review product vs point RDD results into 'gap analysis showing what ERP package offers and what Requirement Definition and Description (RDD) states. This confirms the utility of ERP product and makes a clear prescription of changes, which are must in the ERP solution. Second review is 'ERP configuration reviews' to confirm that configured ERP for customer specific requirement is useful to the users. And third and final review is after, say six months usage, to confirm that RDD is fully implemented and the solution meets all requirements, namely function, features, facilities, technology interface , information requirements and reports and queries. Nine steps implementation model is dynamic where each steps is checked, reviewed and confirmed. Implementation process is user driven and involves management of the organization.

The major hassles in the ERP implementation are due to :-

1. The resistance of the users in the acceptance of standard ERP solution.
2. The limited awareness of the users and the appreciation of the information technology applications.
3. The ability of the users to change over from the old conventional systems to the technology based new systems.
4. The level of acceptance of the standard business processes incorporated in the system. Lower the acceptance, longer the implementation time, resulting into a loss of efficiency and effectiveness of the solution.
5. A lack of clarity on the business requirement, the customer focus and the strategy of the business and its impact on the ERP solution.
6. The ERP implementation is carried out without properly evaluating the business processes and practices through business process reengineering and is preceded restructuring of the organization.
7. The choice of the ERP solution not all the ERP solutions are appropriate for the organization. Each solution has its own peculiarities in terms of design , architecture , technology , coverage of business scope , functions and features . Some solutions are good for certain time of business and industry and not for all the business and industries.

Ideally the choice should be based on the ERP fit for the organizations, functions and features .Higher the fit, is the solution from all angles. If the fit is higher, the customization will be less and the user acceptance will be higher. In short the implementation cycle would be short. To meet industry specifically requirement more effectively, ERP vendors have brought out additional industry specific modules. These modules are implemented along with main ERP solution.

The implementation methodology also consists of *the following steps:*

i)**Strategy:** Option is available for those organizations having multiple sites to implement first at one site as pilot project. Implementing ERP in a pilot project is a good idea because it will give implementation team a feel for the issues in an actual implementation, the peculiarities of the organization, its work environment and so on. When incremental approach is used , all ERP modules are not implemented in one step. The different modules are introduced one by one.

ii)**Plan:** the implementation plan documents the who, what, why, where, when, and how of the project. The plan provides a guide to the project and is used to monitor progress. Specialized packages are available such as Microsoft Project. These capture a lot of detail about the project,

enable different views of the project such as time scale or critical path, and facilitate the reporting of many different issues, e.g. costs, resource usage and overdue activities.

iii)Cost: The total cost of ERP ownership includes the cost of packaged software, hardware, professional services (for ongoing maintenance, upgrades and optimization) and internal costs. The cost of packaged software depends on the scope of implementation (the number of ERP modules and the number of end users), complexity of software and ERP vendors. Implementation of ERP systems routinely requires purchase of new computer hardware, systems software, network equipment and security software. Implementation requires the services of many professionals for customization, integration, data conversion, data migration, testing and training. In identifying where the costs are likely to arise, consideration should be given to hardware, operating system, database license fee, core software license fee, additional module license fee, additional seat license fee, third party software license fee, integration of third party software, software customization, project management, consultancy, training, living and travel expenses, software maintenance or warranty renewal and upgrades. For cost a long term perspective should be taken, a meaningful time horizon is five years. It is common to provide yearly maintenance cost to be 10% of the initial cost outlay.

iv)Performance Measurement: We know about three performance related measures-costs, time and benefits, one more are deliverables. The use of deliverables provides the opportunity to assess the effectiveness of what is being done.

v)Problem resolution: It is desirable that there is an agreed procedure for recording issues and their resolution.

vi)System Issues: Tasks will be identified on the project plan but those involved will normally be the IT systems personnel.

13.3. SUMMARY:

This unit introduces about the enterprise resource planning life cycle. It also describes about the Implementation methodologies with different views. A nine step approach to ERP implementation is discussed. This unit also shows the major hassles of ERP implementation which consists of problem analysis and performance measures.

13.4. KEY WORDS:

Electronic Management system, Enterprise resource planning, Re-engineering, Package selection, Package evaluation,, Operation and Maintenance, Hardware and Software requirements.

13.5. EXERCISE:

1) How do ERP systems deliver dramatic productivity improvements and cost reductions?
2) What are the two basic characteristics of ERP implementation projects
3) What are the objectives of ERP implementation?
4) What is the scope of an ERP project?
5) What are the benefits of an ERP implementation
6) What do you mean by the complexity of an ERP implementation?

13.6. REFERENCES:

1)Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2)Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition,Tata MC-Graw HILL.

3)ERP Demystified – 2nd edition, Alexis Leon.

UNIT 14: INTRODUCTION TO ERP

Structure

14.0 LEARNING OBJECTIVES

After studying this unit, you will be able to

- Realize the importance of ERP
- Understand about cross functional enterprise
- Realizations of SCM,ERP,CRM functionalities
- Identify the applications of functional business system
- Define the marketing systems

14.1 INTRODUCTION TO ERP:

Information Technology being the back bone, Enterprise Resource Planning (ERP) covers the techniques and concepts employed for the integrated management of businesses as a whole, from the viewpoint of the effective use of management resources, and to improve the efficiency of an enterprise. ERP packages are unified (covering all business functions) software packages that support the above ERP concepts. In the 90's, ERP packages were targeted at the manufacturing industry, and consisted mainly of functions for planning and managing core businesses such as sales management, production management, accounting and financial affairs, and so on. However, in the last decade, adaptation not only to the manufacturing industry, but also to diverse types of industry has become possible. With the ever developing and innovating IT techniques, the expansion of implementation and use of ERP packages has been progressing on a global level.ERP software is intentionally designed to model and automate many of the basic processes of a company. It established an effective link between the various functions of a company from the top level to the bottom level of the hierarchy, with the goal of integrating information across the company; for example, a communication channel is established between the finance department and the shop floor for information sharing. This software helped in eliminating complex and expensive links between computer systems that were never meant to talk to each other. It also established a faultless and continues flow of information within the company.

The ERP system deals with the planning and use of resources used in the business. The resources are finance, materials, manufacturing capacity and human resource. The ERP provides methodology of assessing the resource needs for a given business plan to achieve certain business objectives. It also helps to execute the strategies, plans, decisions, and actions in time bound manner; The ERP provides a support system in the transaction processing, updating, and reporting across the function. The ERP is a package encompassing all major functions of the business. The product is generic in nature and is supposed to incorporate the best business practices, generally followed in most of the companies. The product philosophy is to implement the system as it is with some customization which may by typical to the customer requirement. The system design of the ERP is integrated with the features and function providing an enterprise wide solution to handle all the process functionalities. For example, it provides capability to process the purchase order from ordering to bill processing, and also meets the information needs of purchase, stores manufacturing accounts and finance.

Figure 14.1 shows how information is integrated within an organization using an ERP system. This system is similar to the pre-ERP system but, in the ERP system all the different departments of an organization are linked to a centralized system which stores all the information from various departments. Any department at any time can gain access to any required information from another department via ERP or from the ERP data base itself. The manufacturing department can access information form quality management department via ERP system. This shows the flexibility of a system, where independent departments are bonded together as a unit and any two departments can establish communication at ease without depending on any other departments.
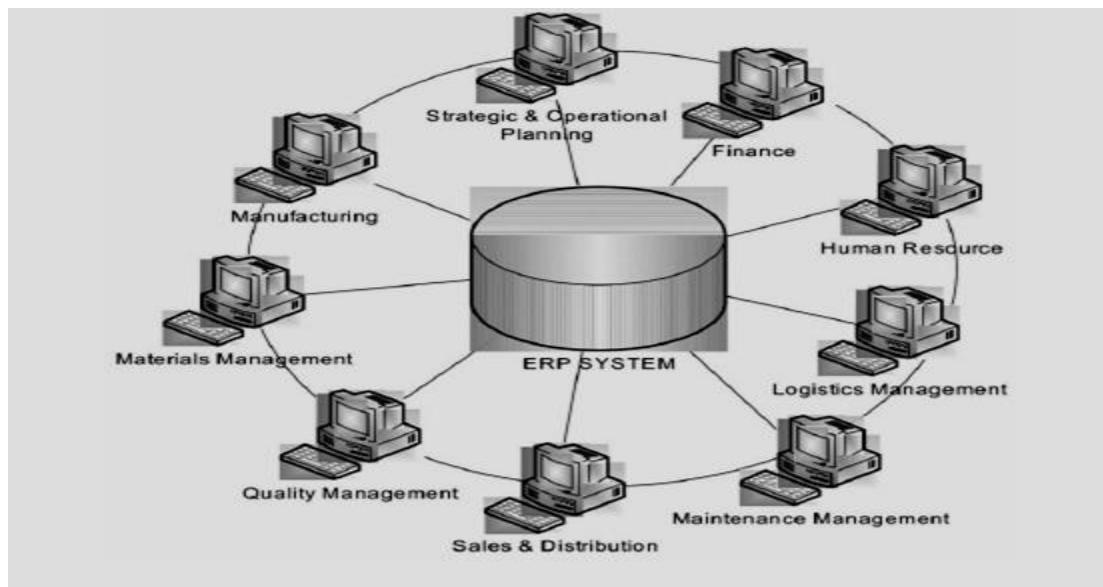
Fig. 14.1. Example of Enterprise planning Resource

ERP Architecture

Any information system has three basic components, viz., the Data Management, the Application Logic, and the Presentation. These components can be built with the client server role definitions. The client is a user and the server provides the services required by the user to run the system. Since, the information needs are dynamically changing, the architecture required is to separate the data and its management from its application. The user requires the choice of using the data as it suits him the most. Hence the application logic has to be separate from the data. There is also a variability in the manner how the application logic is developed and presented. The architecture could be a two tier or three tier as shown in Fig. 14.2.
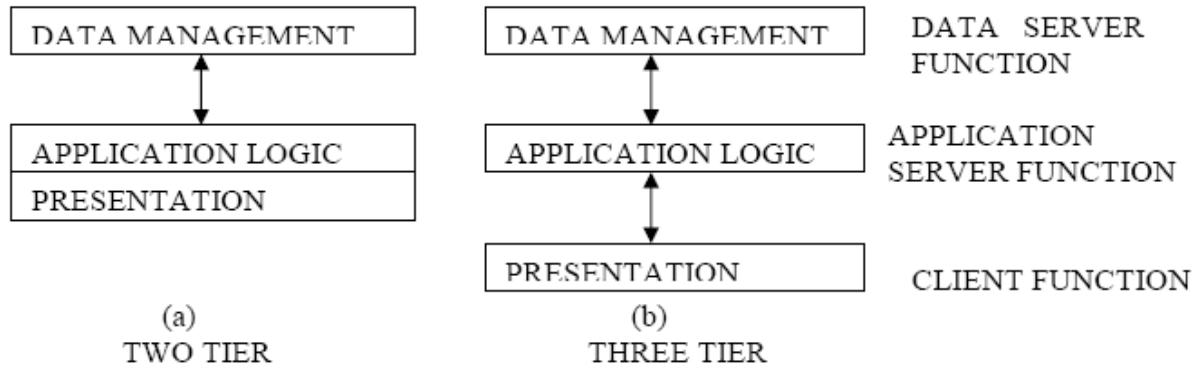
Fig.14.2. Client Server model architecture

Since, the ERP is a generic solution for the business operations, in each case of implementation, customization should suit the specifics of the business or customer. The architecture choice is influenced by this requirement. In a two tier system architecture, there is a rigid division of roles. The data management is by the server and its processing is through the application logic by client. In this architecture all the requirements are sent to the server by all the users in the network. This affects the load on the server and the response time to the user increase. However, there could be an application which deals with high volume and complex data structure and this approach is more efficient, if response issue is taken care of by the high end multiple CPU and the parallel processing hardware platforms. There could be a case where the user is dumb and is required to use the system in a guided manner with the .help. assistance. Then the three tier architecture is suitable. The client uses the GUI (Graphical User Interface) tools for simplicity while the application logic is processed on another machine. In this architecture three distinct roles are defined and three hardware platforms are made responsible to perform.The servers play two distinct roles of handling the data and the application logic. This logic which deals with the data more is attached to the server platform, where the data is being managed. The logic which deals with the presentation and the specific needs of the user is left to the client platform as shown in Fig. 14.3.

```
┌─────────────────────────────┐
│      DATA NABAGENEBT         │
├─────────────────────────────┤      SERVER
│     APPLICATION LOGIC        │
└─────────────────────────────┘
              ↕
┌─────────────────────────────┐
│     APPLICATION LOGIC        │
├─────────────────────────────┤      CLIENT
│       PRESENTATION           │
└─────────────────────────────┘
```
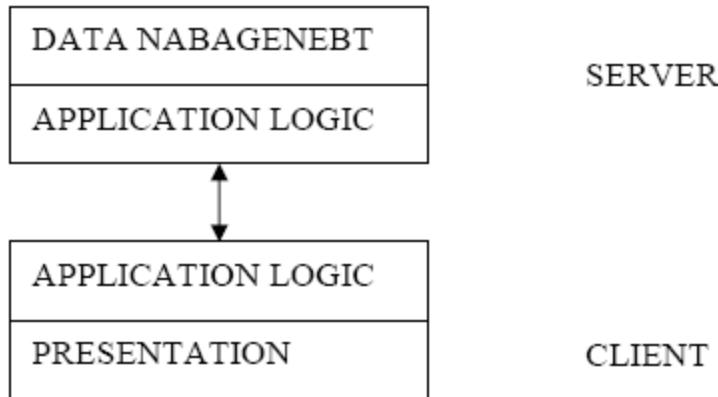
Fig.14.3. Client/Server – Model architecture

It is very difficult to recommend one or the other architecture as the solution to overcome a typical requirement problem. In the choice of architecture, what is important is the user environment and the information needs and how the user handles them? The best architecture, in a given environment, is the one which is user friendly, easy to understand and easy to maintain. The technology solution are available to implement this philosophy.

The ERP solutions are multi-users which are distributed over the organization, spread over to any length. Two main solutions are available to the designer and the implementor of the ERP. One is the Graphical User Interface (GUI) and the Network Management. The GUI is chosen since it allows the customization for a particular business entity. The GUI screens are so developed that the process running across the organization is mapped to the business flows instead of the discrete business functions. The network is typically the bottleneck in any client/server system. With the application logic, appropriately divided between client and server, it creates a reduced traffic intensity due to GUI interface. Accompanying the network efficiency and the GUI, the ERP solution uses a scalable architecture and a parallel processing technology by installing the suitable server at the required locations. This ensure good performance with a continuous increased load conditions. For most of the customers, the ERP offers a basic business functionality. However, some users have particular needs for which they want an additional support through the tools or other modules. Most of these requirements are extensions to the basic business functions. These customer specific needs are met through a popular and a widely used, client/ server tool set. The business being complex requires a variety of systems to run efficiently. The presence of existing systems is not challenged or minimized by the ERP solution.

In fact, most of the ERP solutions use open application programme interfaces that enable easy coexistence and integration with the legacy and the third party systems. The solutions also provides the gateways to the popular database which are used in business. The ERP solution are designed to make the office of the business paperless. It keeps all the business information online. Then, the users use the Work Flow Technology to move the process in a screen format from person to person for the changes, the approvals and the execution. With the multi-media technology, the servers can be configured to keep the business information online in any format, including the text, the spreadsheet, the image audio and the network video. The solution offers support for the electronic notifications, through the EDI, the E-mail, or the internet to the business partners. For example, you can create a purchase order, get it justified and approved by the authorized person sitting at the other location, attach the engineering drawing to the purchase order by accesses to the CAD system, assemble the documents of the purchase order, and have it sent through the EDI to a vendor located at a distant location without creating any the paper documents.

14.2. CROSS FUNCTIONAL ENTERPRISE APPLICATIONS:

Major e-business applications and their interrelationships are explained in the enterprise architecture. These applications are integrate cross functional enterprise systems such as enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM). These applications may be interconnected by enterprise application integration (EAI) systems so that business professionals can more easily access the information resources they need to support the needs of customers, suppliers, and business partners. Enterprise collaboration systems (ECS) are cross-functional systems that support and enhance communication and collaboration among the teams and workgroups in an organization. All these are discussed in detail in the next chapter with the example.

Customer Relationship Management: The Business Focus. Customer relationship management is a cross-functional enterprise system that integrate and automates many of the customer-serving processes in sales, marketing, and customer services that interact with a company's customers. CRM systems use information technology to support the many companies who are reorienting themselves into customer-focused businesses as a top business strategy. The major application components of CRM include contact and account management, sales,

marketing and fulfillment, customer service and support, and retention and loyalty programs, all aimed at helping a company acquire, enhance, and retain profitable relationships with its customers as a primary business goal. However, many companies have found CRM systems difficult to implement properly due to lack of adequate understanding and preparation by management and affected employees. Finally, many companies are moving toward collaborative CRM systems that support the collaboration of employees, business partners, and the customers themselves in enhancing profitable customer relationships.

Enterprise Resource Planning: The Business Backbone. Enterprise resource planning is a cross-functional enterprise system that integrated and automates many of the internal business processes of a company, particularly those within the manufacturing, logistics, distribution, accounting, finance, and human resource functions of the business. Thus, ERP serves as the vital backbone information system of the enterprise, helping a company achieve the efficiency, agility, and responsiveness required to succeed in a dynamic business environment. ERP software typically consists of integrated modules that give a company a real-time cross-functional view of its core business processes, such as production, order processing, and sales, and its resources, such as cash, raw materials, production capacity, and people. However, properly implementing ERP systems is a difficult and costly process that has caused serious business loses for some companies, who underestimated the planning, development, and training that were necessary to reengineer their business processes to accommodate their new ERP systems. However, continuing developments in ERP software, including Web-enables modules and e-business software suites, have made ERP more flexible and user-friendly, as well as extending it outward to a company's business partners.

Supply Chain Management: The Business Network. Supply chain management is a cross-functional inter-enterprise system that integrate and automates the network of business processes and relationships between a company and its suppliers, customers, distributors, and other business partners. The goal of SCM is to help a company achieve agility and responsiveness in meeting the demands of their customers and needs of their suppliers, by enabling it to design, build, and sell its products using a fast, efficient, and low cost network of business partners, processes, and relationships, or supply chain. SCM is frequently subdivided into supply chain

planning applications, such as demand and supply forecasting, and supply chain execution, such as inventory management, logistics management, and warehouse management. Developing effective supply chain systems and achieving the business goals of SCM has proven to be a complex and difficult challenge for many firms. But SCM continues to be a major concern and top e-business initiative as companies increase their use of Internet technologies to enhance integration and collaboration with their business partners, and improve the operational efficiency and business effectiveness of their supply chains.

14.3. REAL WORLD CASE:

There are different real world cases for different types of cross functional enterprise. Some of them are explained with their applications in different field with the real world case examples. This section discusses about CRM,ERP and SCM. applications.

a) Real World Case 1 of Customer Relation Management: Canada Post, Foster Parents Plan and Ernex marketing Technologies:

Read the Real World Case on Canada Post, Foster Parents Plan, and Ernex Marketing Technologies. We can learn a lot from these organizations' realization that implementing a CRM solution is tough going—requiring serious commitment and major organizational change. However, for companies willing to make that investment, the results are paying off.

CRM Implementation

A major thrust of Canada Post in its CRM initiative has been to make it easier for customers to do business. Since 1999, Canada Post has reportedly spent $280 million on "business transformation," addressing people, processes, and technology. "It wasn't a systems implementation, it was a business transformation," says Cal Hart, vice-president of product management and business transformation for Canada Post, based in Toronto. "We have a better view of the relationship between the customer and Canada Post." That includes offering differentiated service to different customers. "I always want my mom treated well when she calls Canada Post, but I don't think she needs to be treated as well as a customer who spends $100,000 per year." Before the project began, Canada Post spent a lot of time studying CRM at other

organizations, says Hart. But even then, the organization wasn't fully prepared. "We spent a ton of time studying other companies." Specifically, "we needed to be more sensitive to the amount of change we're bringing to customers and staff." There were challenges involved in getting customers to adopt new processes, especially if new benefits weren't immediately obvious to them. A change "needs to add value for customers. Saying 'make all these changes and we'll give you a correct bill' isn't enough," says Hart. "Why is this of benefit to them?"

Canada Post rolled out employee training centres across the country. "Training is critical," Hart affirms. Still, staff wanted to cling to the old ways, but overall, "the front-line employees embraced this better than we expected. We were giving them an integrated tool to do their jobs." Executive support is mandatory, and it has to be ongoing, says Hart. That's why executives at Canada Post meet each Monday afternoon to review the business transformation.

Hart's advice to other companies looking at CRM is to keep the technology "as standard as possible." Canada Post's implementation is based on SAP technology. "It's all fromSAP or SAP-certified partners, except one piece," says Hart, "and that one piece has caused me more grief than the whole of the implementation. The value will show itself when it comes time for upgrades." Jerry Garcia, global partner for customer interaction at consulting firm Accenture in Toronto, agrees standardization is critical. A heavily customized implementation will be difficult to upgrade, he says: "Later on, you'll pay for it in maintenance and upgrades." When it comes to CRM, "don't rush into it," advises Gerry Wong, CIO at Foster Parents Plan in Toronto. His organization uses Cognos technology to manage its donor data. "It helps us define our customers, and how loyal they are," says Wong. CRM should "facilitate and create relationships," he says. Canadians currently sponsor 115,000 children through Foster Parents Plan in countries from Tanzania to Bangladesh to Brazil with monthly donations, as well as gifts and letters. The operational complexity of the task is significant. Wong says it's important to profile customers and to understand their various points of interaction, whether that's via mail, phone, fax, e-mail, or the Web. Foster Parents Plan is working on integrating all of those systems, as well as its finance and payment systems. That will be particularly important as the organization plans to roll out a "self-service" area on its Web site, he says. Ernex Marketing Technologies Inc. in Burnaby, British Columbia, provides real-time marketing solutions for clients that include Eddie Bauer,

Nike, and Radio Shack. "Ernex helps identify who customers are, and communicates back in meaningful, targeted ways," says Malcolm Fowler, executive vice-president of product marketing. The challenge is particularly difficult for retailers, he says, compared to other organizations (such as banks, for instance) that begin their relationships knowing critical information about their clients. However, for retailers, the first interaction is generally at the cash register. "Retailers at the outset don't know who their customer is," says Fowler. In many cases, loyalty programs can become a CRM tool, he says. Over time, retailers can capture and understand buying history and patterns to better market to specific customers. Ernex uses Cognos tools to analyze data. "We enable programs in real time at the point of sale," says Fowler, explaining that retailers can immediately offer service or promotions when ringing through a purchase, based on an understanding of a specific client's history. And while every customer should be treated well, he says, it doesn't make sense to suggest that "the effort an organization should take with best customer or worst customer should be the same. That's the promise of CRM—to be able to react differently depending on what a customer is spending with the company—all customers are not equal to the organization." His recommendations for adoption of CRM are as follows:

• Establish the program around the core of the business, core values and beliefs.

• Rally management and organizational support in the store and behind the scenes.

• Keep it fresh. Tailor the message to individual customers. Test and conduct research to better understand your customers.

• Keep it simple. "Complexity is not an asset to loyalty programs. If you can't explain in 30 seconds to your staff how the program works so they get it, your customers don't have a hope," says Fowler.

• Be upfront with a corporate privacy policy, so customers understand how you will use the information they provide.

According to Accenture's Garcia, there's often a "big gap" between corporations' expectations for return on investment and what actually occurs. Executives must look beyond CRM as a technology investment, "as a way to completely transform business processes. CRM may not reap the financial rewards at the pace you expect, but if implemented correctly it will provide business stability and a customer-centric perspective." Of note, an Accenture survey reported

that 91% of executives said "a greater focus on customer service and building customer loyalty is critically important, not only in weathering the economic downturn, but also in strategically positioning their business for its eventual upswing." Garcia outlines some recommendations for a successful implementation:

• Define the business problem first, then look for the solution. Don't put the proverbial cart before the horse. CRM doesn't solve everything.

• Understand that CRM is not a tool: It is a new way of doing business. Expect an overall corporate way of doing business. Expect an overall corporate change, including training and culture. Many companies implement technology, "but don't change the company to align to the new CRM thinking," he says. "There's a lack of real focus on alignment."

• Start from the top down—your CRM project needs to be driven by corporate executives. Don't leave it up to IT alone. Offer incentives to all staff to get involved. "Companies often expect people to change their behaviour, but they fail to change the compensation or rewards," notes Garcia. "The result is the same behaviour as before."

Case Study Questions:

1. Hart's advice for implementation of CRM is to keep the technology standard. Do you agree with this advice? Why or why not?

2. Why do you think participation of senior executives in the implementation of CRM should be mandatory?

3. What are the pros and cons of CRM system implementation in any organization?

_____

B)REAL WORLD CASE : ENTERPRISE RESOURCE PLANNING:

_____

Read the Real World Case on Indigo Books & Music Inc. on the next page. We can learn a lot about issues that should be considered in selecting and implementing an ERP system. Indigo Books & Music Inc. selected mySAP Retail as its IT platform for all retail operations. The system helps the national retailer perform inventory and category management, supply chain

management, and customer-relationship management across its entire operation, including its 89 superstores, its 188 mall stores, and its online division.

Indigo Books & Music Inc . :Selecting and Implementing an ERP System:

Doug Caldwell, Indigo Books & Music Inc.'s chief technology officer, says one of the primary drivers for standardizing on SAP was the acquisition of Chapters, finalized in early 2001, which included box stores bearing the Chapters name, its Pegasus distribution business, the World's Biggest Bookstore in Toronto, and SmithBooks and Coles outlets. Essentially, the business was sliced up into four divisions with their own cultures and systems. "As we brought the whole company together, the main focus of 2001 was 'let's just get it onto common systems.'"

When it came to the retail locations at the time of the merger, says Caldwell, it made sense to defer to the 300-some Chapters stores rather than the 15 Indigo locations for the purposes of scalability. We implemented a Retek merchandising system back in 1996. "The version of Retek we have was very customized, to the extent that about 60% of the code was customized, and they have evolved that product quite a bit since then," explains Caldwell. Currently, Indigo uses Oracle Financials for its reporting capabilities Indigo made a decision at the executive level in November 2001 that selecting a new IT platform would be a strategic initiative for 2002, says Caldwell. "Are we going to fix what we already have, upgrade, or replace?" The first step was to map how the organization functioned. "Out of that we identified a lot of what we called negative variances," says Caldwell, "things that were broken. That gave us a list of requirements that we needed to go to the market with." By February of the next year, Indigo had a laundry list of what it liked and what it didn't like. At that point in time, he says, Indigo hired Cap Gemini Ernst & Young to aid in the selection process. One of the challenges particular to the book industry, notes Caldwell, is that in the larger stores, there are about 100,000 titles to be managed at any given point, and about 25,000 titles in the smaller stores. "When you look at that across 300 stores, the number of individual store/book combinations you're managing is in the tens of millions." Add the characteristics of each item—availability, demand, and seasonal variance, for example—and "it's just a huge amount of data to try to manage." The existing Retek system looks at a one-

metre linear section of fiction the same way everywhere, whether it's at a large Indigo store in downtown Toronto or a small Coles location on the east coast. "If I'm in Moncton, I probably want to have [less] fiction than history,"Caldwell says. "I want to bring in some of the local history." But Retek just looks at it as one metre of books—the system doesn't care what it is. "The tool was really outdated for the ways we wanted to merchandise the stores." Hence, category management is one of the top functionalities Indigo hopes to pull out of its mySAP deployment, as well as to improve its supply chain to better forecast what titles the bookseller needs. "We'd love to be able to share that with the publishers, to enable them to have better forecasts in terms of their production runs."

When Indigo forecasts in terms of their production runs." When Indigo decided to go to market for a solution, Caldwell says, it had to decide whether it would select one solution to meet all of its needs or go with a best-of-breed approach. "The challenge we're faced with right now is the number of interfaces that need to be maintained," he explains. "Each store has its own master file of data. It becomes incredibly challenging to make sure we have consistent data across the organization. The design goal definitely was to reduce that as much as possible." That didn't necessarily mean picking an all-in-one answer, notes Caldwell. Early on, Indigo didn't even consider dropping Oracle for its financials—the priority was the merchandise planning and forecasting, and category management. The bookseller ended up evaluating four packages, including SAP and the latest version of Retek, through one-day demos to the various stakeholders in the Indigo organization, some 30-odd people, says Caldwell. "In that evaluation process, we looked at four criteria: category management, inventory management, execution, and customer support." Indigo also checked customer references and had its own IT people look under the covers to gauge exposed interfaces, upgrade capabilities, stability of the vendor, and training available. At the end of the day, SAP came out on top. "Before we made a commitment," says Caldwell, "we did what we call a four-day conference room pilot. We actually look our data, had SAP load it on to its system, and brought that same core team of 30 people for a four-day 'down-anddirty' of what a day in the life of Indigo would be like with SAP. That gave us a chance to really see how the system would work with our data. By the end of June, we were able to say that SAP is the platform we want to go forward with." Indigo has just embarked on a three-month blueprinting phase, says Caldwell, and it has already discovered

some potential improvements to existing processes—for example, the classification of SKUs [stock-keeping units] themselves. "If you look at cookbooks, *The Joy of Cooking* is a standard staple item book," he notes. "You always want to have two in stock in small stores and you may want to have four or five in stock in a large store. All you need to do is keep it in stock unless you're promoting it, so the thinking is to do some automatic classification of some of those items." In this model, The Joy of Cooking would always be replenished automatically when a copy was sold, without any human intervention.

Case Study Questions

1. What are the challenging aspects of category management at Indigo?

2. Why was detailed analysis of business processes at Indigo completed before selecting mySAP?

3. What are the challenging aspects of mySAP retail system implementation at Indigo?

_____

C) REAL WORLD CASE 3 : SUPPLY CHAIN MANAGEMENT:
_____

Read the Real World Case on Wal-Mart and Mattel. We can learn a lot from this case about how optimal supply chain management is used in support of a company's strategic advantage.

Wal-Mart and Mattel:Supply Chain Management Best Practices:

Being a supplier to Wal-Mart is a two-edged sword," says Joseph R. Eckroth Jr., CIO of Mattel, Inc. (www.mattel.com), based in El Segundo, California. "They're a phenomenal channel but a tough customer. They demand excellence."It's a lesson that the toy manufacturer and thousands of other suppliers learned as the world's largest retailer—Wal-Mart Stores (www.walmart.com)—built an inventory and supply chain management system that changed the face of business. By investing early and heavily in cutting-edge technology to identify and track sales on the individual item level, the Bentonville, Arkansas-based retail giant made its IT infrastructure a key competitive advantage that has been studied and copied by companies around the world.

"We view Wal-Mart as the best supply chain operator of all time," says Pete Abell, retail research director at high-tech consultancy AMR Research in Boston. Abell says he expects the company to remain in the vanguard: "Wal-Mart is evolving; they're not standing still." The company is still pushing the limits of supply chain management, he says, searching for and supporting better technology that promises to make its IT infrastructure more efficient. Radio frequency identification (RFID) microchips, for example, may replace bar codes and security tags with a combination technology that costs less money. Early on, Wal-Mart saw the value of sharing that data with suppliers, and it eventually moved that information online on its Retail Link Web site. Opening its sales and inventory databases to suppliers is what made Wal-Mart the powerhouse it is today, says Rena Granofsky, a senior partner at J.C. Williams Group, a Toronto-based retail consulting firm. While its competition guarded sales information, Wal-Mart approached its suppliers as if they were partners, not adversaries, says Granofsky. By implementing a collaborative planning, forecasting, and replenishment (CPFR) program, Wal-Mart began a just-in-time inventory program that reduced carrying costs for both the retailer and its suppliers. "There's a lot less excess inventory in the supply chain because of it," says Granofsky. That efficiency is the key factor in maintaining Wal-Mart's low-price leadership among retailers, says Abell. "Their margins can be far lower than other retailers' because they have such an efficient supply chain," he says. The company's cost of goods is 5 to 10% less than that of most of its competitors, Abell estimates.

Wal-Mart's success with supply chain management has inspired other retail companies, which are now playing catch-up, says Abell. "Others are now just starting. They've all had inventory systems, but sharing the data with their partners hasn't been easy," he says. Wal-Mart's influence has extended beyond the retail sector. Mattel's Eckroth says that he studied Wal-Mart's supply chain best practices when he worked at a manufacturing division of General Electric Co. "[Wal-Mart is] a benchmark company," he says. One reason Wal-Mart is studied so closely is that it gets buy-in from its suppliers to an incredible degree. That's because its programs and practices benefit not just the retailer, but its partners as well, says Eckroth. CPFR, he says has "blurred the lines between supplier and customer. You're both working to the same end: to sell as much product as possible without either of us having too much inventory. We've learned that if we

listen to Wal-Mart, take their initiatives seriously, and align our strategies with making them successful, we both can succeed," he says. Mattel has learned a lot from working with Wal-Mart and is bringing those lessons to bear in its relationships with other channels, says Eckroth. "Getting the supply chainoptimized inside of Mattel is only 50% of the equation," he says. "The other 50% is getting tightly linked with every one of our customers so that we're reacting as quickly as they're giving us data." Tight links, Eckroth says, will enable Mattel to tackle the next big business problem—increasing manufacturing efficiency.

"My ability to get information about the sales pace of a toy and either ramping up or shutting down manufacturing depends on my having data," he says. Having sales data on a daily or hourly basis is necessary to figure out on a micro level what is selling best where and tailor manufacturing accordingly. The greatest efficiencies will appear when the kind of trusting, mutually beneficial relationship Mattel has with Wal-Mart is duplicated with the rest of the manufacturer's retail outlets. "Having that data on a global basis from every one of my customers allows me to optimize the sales of my products and the fill rates of my customers," Eckroth says. "The theme for the future is that at the end of the day, there can be a symbiotic relationship between companies."

Case Study Questions:

1. Do you agree that Wal-Mart is "the best supply chain operator of all time"? Why or why not?

2. What has Mattel learned from Wal-Mart? How well is Mattel applying this knowledge to its own business? Explain your evaluation.

3. What can other businesses learn from the experiences of Wal-Mart and Mattel that could improve their supply chain performance? Use an example to illustrate your answer.

14.4. FUNCTIONAL BUSINESS SYSTEM:

There are many ways to use information technology in business as there are business activities to be performed, business problems to be solved, and business opportunities to be pursued. As a business professional, we should have a basic understanding and appreciation of the major ways

information systems are used to support each of the functions of business that must be accomplished in any company that wants to succeed.

Functional business systems are composed of a variety of types of information systems (transaction processing, management information, decision support, etc.) that support the business functions of:

• Accounting

• Finance

• Marketing

• Productions/operations management

• Human resource management

There is a strong emphasis in many organizations to develop such composite or cross-functional information systems that cross the boundaries of traditional business functions in order to reengineer and improve vital business processes. These organizations view cross-functional information systems as a strategic way to share information resources and improve the efficiency and effectiveness of a business, thus helping it attain its strategic objectives.

Business firms are turning to Internet technologies to integrate the flow of information among their internal business functions and their customers and suppliers. Companies are using the World Wide Web and their intranets and extranets as the technology platform for their cross-functional and inter-organizational information systems.

14.5.INTRODUCTION TO MARKETING SYSTEMS:

The business function of marketing is concerned with the planning, promotion, and sale of existing products in existing markets, and the development of new products and new markets to

better serve present and potential customers. ***Marketing information systems*** integrate the information flow required by many marketing activities. Marketing information systems provide information for:

• Internet/intranet websites and services make an *interactive marketing* process possible where customers can become partners in creating, marketing, purchasing, and improving products and services.

- • *Sales force automation* systems use mobile computing and Internet technologies to automate many information processing activities for sales support and management.

• Other marketing systems assist marketing managers in product planning, pricing, and other product management decisions, advertising and sales promotion strategies, and market research and forecasting.

Interactive Marketing

The explosive growth of Internet technologies has had a major impact on the marketing function. The term ***interactive marketing*** has been coined to describe a type of marketing that is based on using the Internet, intranets, and extranets to establish two-way interaction between a business and its customers or potential customers. The goal of interactive marketing is to enable a company to profitably use those networks to attract and keep customers who will become partners with the business in creating, purchasing, and improving products and services.

Interactive marketing:

• Customers are not passive participants, but are actively engaged in a network-enabled proactive and interactive process.

• Encourages customers to become involved in product development, delivery, and service issues.

• Enabled by various Internet technologies, including chat and discussion groups, Web forms and questionnaires, and e-mail correspondence.

• Expected outcomes are a rich mixture of vital marketing data, new product ideas, volume sales and strong customer relationships.

Targeted Marketing:

Targeted marketing has become an important tool in developing advertising and promotion strategies for a company's electronic commerce websites. Target marketing is an advertising and promotion management concept that includes five targeting components:

• *Community* – companies can customize their web advertising messages and promotion methods to appeal to people in specific communities. These can be communities of interest, such as virtual communities of online sporting enthusiasts or arts and crafts hobbyists, or geographic communities formed by the websites of a city or other local organizations.

• *Content* – advertising such as electronic billboards or banners can be placed on various website pages, in addition to a company's home page. These messages reach the targeted audience.

• *Context* – advertising appears only in Web pages that are relevant to the content of a product or service. So advertising is targeted only at people who are already looking for information about a subject matter that is related to a company's products.

• *Demographic/Psychographic* – marketing efforts can be aimed only at specific types or classes of people: unmarried, twenty-something, middle income, male college graduates.

• *Online Behavior* – advertising and promotion efforts can be tailored to each visit to a site by an individual. This strategy is based on "web cookie" files recorded on the visitor's disk drive from previous visits. Cookie files enable a company to track a person's online behavior at a

website so marketing efforts can be instantly developed and targeted to that individual at each visit to their website.

14.6. SUMMARY:

This unit describes about the ERP and its architectural design constraints. The different cross enterprise applications are also explained with the different real world examples. This unit also discusses about the different types of functional business systems with the introduction to the marketing functional system. In this the interactive and targeted marketing system is discussed.

14.7. KEY WORDS:

Enterprise Resource Planning, Cross functional systems, Marketing system, interactive marketing, target marketing.

14.8. EXERCISES:

1. Why is there a trend toward cross-functional integrated enterprise systems in business?

2. Explain the ERP and its architecture applied to educational system.

3. What is the advantage of the functional management system.

4. Differentiate between integrated and targeted marketing systems.

5. Which cross functional system is identified as a best system to the business applications.

14.9. REFERENCES:

1)Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

3) O'Brien, Management Information Systems,2nd edition, Galgotia publications, 1990.

UNIT 15: ONLINE MARKETING SYSTEMS

3.0 Structure

15.1. LEARNING OBJECTIVES:

After studying this unit, you will be able to

- Understand about the marketing system
- Explain about the sales force automation system
- Define the importance of CIM
- Analyze the HRM
- Identify the functionalities of online Accounting system

15.2. MARKETING SYSTEMS:

As discussed in the previous unit marketing system is one of the cross functional system. In the marketing system the relation between the vendor and the customer has be realised in different ways i.e, in selling the product designed, marketing, accounting, use of computer application in online transactions using computers etc.,. All these are executed through the human resource which is identified as a important entity in execution of applications different functionalities through various phases. Hence all the different subcomponents of the systems and their

applications in the organisation or companies are detailed discussed in the next sections.

15.3. SALES FORCE AUTOMATION:

Increasingly, computers and networks are providing the basis for *sales force automation*. In many companies, the sales force is being outfitted with notebook computers that connect them to Web browsers, and sales contact management software that connect them to marketing websites on the Internet, extranets, and their company intranets. Characteristics of sales force automation include:

- Increases the personal productivity of salespeople.

• Dramatically speeds up the capture and analysis of sales data from the field to marketing managers at company headquarters.

• Allows marketing and sales management to improve the delivery of information and the support they provide to their salespeople.

• Many companies view sales force automation as a way to gain a strategic advantage in sales productivity and marketing responsiveness.

15.4. COMPUTER-INTEGRATED MANUFACTURING (CIM):

Computer-based manufacturing information systems use several major techniques to support *computer-integrated manufacturing* (CIM). CIM is an overall concept that stresses that the goals of computer use in factory automation must be to:

• **Simplify** - (reengineer) production processes, product designs, and factory organization as a vital foundation to automation and integration.

• **Automate -** Production processes and the business functions that support them with computers, machines, and robots.

- **Integrate** - All production and support processes using computers, telecommunications networks, and other information technologies.

Overall goal of CIM: - It goal is to create flexible, agile, manufacturing processes that efficiently produce products of the highest quality. Thus, CIM supports the concepts of:

• Flexible manufacturing systems

• Agile manufacturing

• Total quality management

Results of CIM: - Implementing such manufacturing concepts enables a company to quickly respond to and fulfill customer requirements with high-quality products and services. Uses of computers in manufacturing include:

• Computer-aided engineering (CAE)

• Computer-aided design (CAD)

• Computer-aided process planning (CAPP)

• Material requirements planning (MRP)

• Manufacturing resource planning (MRP-II)

• Computer-aided manufacturing (CAM)

Benefits of CIM are:

• Increased efficiency through:

- work simplification and automation,

- better production schedule planning

- better balancing of production workloads in production capacity

• Improved utilization of facilities, higher productivity, better quality control through:

- continuous monitoring

- feedback and control of factory operations, equipment and robots.

• Reduced investments in production inventories and facilities through:

- work simplification

- just-in-time inventory policies

- better planning and control of production

- better planning and control of finished goods requirements

• Improved customer service through:

- reducing out-of-stock situations

- producing high-quality products that better meet customer requirements

15.5. HUMAN RESOURCE MANAGEMENT:

The *human resource management* (HRM) function involves the recruitment, placement, evaluation, compensation, and development of the employees of an organization. The goal of HRM is the effective and efficient use of the human resources of a company. *Human resource information systems* are designed to support:

- ☐ Planning to meet the personnel needs of the business

- Development of employees to their full potential

- Control of all personnel policies and programs

Traditionally, businesses used computer-based information systems to:

• Produce paychecks and payroll reports

• Maintain personnel records

• Analyze the use of personnel in business operations

Many firms have gone beyond these traditional *personnel management* functions and have developed human resource information systems (HRIS) that also support:

• Recruitment, selection and hiring

• Job placement

• Performance appraisals

• Employee benefit analysis

• Training and development

• Health, safety, and security

HRM and the Internet:
The Internet has become a major force for change in human resource management. For example, companies are:

• Recruiting for employees through recruitment sections of their corporate websites.

• Using commercial recruiting services and databases on the World Wide Web

• Posting messages in selected Internet newsgroups

• Communicating with job applicants by Internet e-mail.

HRM and the Corporate Intranet

Intranet technologies allow companies to process most common HRM applications over their corporate intranets. For example:

• Intranets allow the HRM department to provide around-the-clock services to their customers – the employees

• Intranets allow for the dissemination of valuable information faster than through previous company channels

• Intranets can collect information online from employees for input to their HRM files

• Intranets enable employees to perform HRM tasks with little intervention by the HRM department

• Intranets can serve as a superior training tool

• Intranets enable employees to produce automated paychecks, the online alternative to timecards

15.6. ONLINE ACCOUNTING SYSTEM:

Accounting information systems are the oldest and most widely used information systems in business.Computer-based accounting information systems:

• Record and report the flow of funds through an organization on a historical basis and produce important financial statements such as balance sheets and income statements

• Produce forecasts of future conditions such as projected financial statements and financial budgets

• Operational accounting systems focus on transaction processing systems. They emphasize legal and historical record-keeping and the production of accurate financial statements.

Typically, operational accounting systems include:

Order Processing: Captures and processes customer orders and produces data for inventory control and accounts receivable.

Inventory control: Processes data reflecting changes in inventory and provides shipping and reorder information.

Accounts receivable: Records amounts owed by customers and produces customer invoices, monthly customer statements, and credit management reports.

Accounts payable: Records purchases from, amounts owed to, and payments to suppliers, and produces cash management reports.

Accounts payroll: Record employee work and compensation data and produces pay checks and other payroll documents and reports.

General ledger systems: Consolidates data from other accounting systems and produces the periodic financial statements and reports of the business.

• Management accounting systems focus on the planning and control of business operations. They emphasize:

  • Cost accounting reports

  • Development of financial budgets and projected financial statements

  • Analytical reports comparing actual to forecasted performance

Online Accounting Systems:

Accounting information systems are being affected by Internet and client/server technologies. Using the Internet, intranets, extranets, and other network changes how accounting information systems monitor and track business activity. The online, interactive nature of such networks calls for new forms of transaction documents, procedures, and controls. Many companies are using or developing network links to their trading partners through the use of the Internet or other networks for applications such as order processing inventory control, accounts receivable, and accounts payable.

15.7. SUMMARY:

This unit describes about CIM,HRM, Marketing and online accounting systems with their characteristics and functionalities. It also gives an complete overview of onl9ine accounting system with the usage of internet, intranet, extranets and transaction procedure of the documents. It also discusses the controlling functions of the Human resource management. This unit also brings out the goals, benefits and characteristics of CIM. Lastly the importance of the online accounting systems are discussed in terms of the client server technologies to explain the

importance of online applications for handling different business sectors and the organisations/companies.

15.8. KEY WORD:

Marketing system, Characteristics of sales force automation, Goals of CIM, phases of HRM, intranet, internet, extranet, client-server architecture, operational accounting functions, Computer based systems.

15.9.EXERCISES:

1. Explain the different functionalities of marketing systems.
2. Identify and explain the importance of CIM with its benefits and its goals
3. Explain the different components used in online accounting system. Explain the same for an banking system organisation.
4. Justify the use of HRM with intranet and corporate systems. Also specify its importance in managing the business.
5. Explain the characteristics of sales force automation system.

15.10. REFERENCES:

1)Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

3) O'Brien, Management Information Systems,2nd edition, Galgotia publications, 1990.

UNIT 16: ENTERPRISE MANAGEMENT

Structure

16.1. Learning Objectives

16.2. Customer Relationship Management

16.3. Enterprise Resource Planning

16.4. Supply Chain Management

16.5. Summary

16.6. Key words

16.7. Exercise

16.8. References

16.1. Learning Objectives:

After studying this unit, you will be able to

1. Identify the CRM components
2. Explain the phases of CRM
3. Define the properties of ERP
4. Understand CRM and its role

16.2. CUSTOMER RELATIONSHIP MANAGEMENT:

Customer-focused business is one of the top business strategies that can be supported by information technology. Many companies are implementing customer relationship management (CRM) business initiatives and information systems as part of a customer-focused or customer centric strategy to improve their chances for success in today's competitive business environment.

CRM is described as a cross-functional e-business application that integrates and automates many customer-serving processes in sales, direct marketing, accounting and order management, and customer service and support.

- CRM systems create an IT framework that integrates all the functional processes with the rest of a company's business operations.

- CRM systems consist of a family of software modules that perform the business activities involved in such front office processes.

- CRM software provides the tools that enable a business and its employees to provide fast, convenient, dependable, and consistent service to its customers.

Contract and Account Management

CRM software helps sales, marketing, and service professionals capture and track relevant data about every past and planned contact with prospects and customers, as well as other business and life cycle events of customers.

Sales

CRM software tracks customer contacts and other business and life cycle events of customers for cross-selling and up-selling.

Marketing and Fulfilment

CRM software can automate tasks such as qualifying leads, managing responses, scheduling sales contacts, and providing information to prospects and customers.

Customer Service and Support

CRM helps customer service managers quickly create, assign, and manage service requests. *Help desk* software assists customer service reps in helping customers whom are having problems with a product or service, by providing relevant service data and suggestions for resolving problems.

Retention and Loyalty Programs

- It costs six times more to sell to a new customer than to sell to an existing one.

- A typical dissatisfied customer will tell eight to ten people about his or her experience.

- A company can boost its profits 85 percent by increasing its annual customer retention by only 5 percent.

• The odds of selling a product to a new customer are 15 percent, whereas the odds of selling a product to an existing customer are 50 percent.

Seventy percent of complaining customers will do business with the company again if it quickly takes care of a service snafu.

• More than 90 percent of existing companies don't have the necessary sales and service integration to support e-commerce.

Examples of business benefits of customer relationship management include:

• CRM allows a business to identify and target their best customers; those who are the most profitable to the business, so they can be retained as lifelong customers for greater and more profitable services.

• CRM enables real-time customization and personalization of products and services based on customer wants, needs, buying habits, and life cycles.

• CRM can keep track of when a customer contacts the company, regardless of the contact point.

• CRM enables a company to provide a consistent customer experience and superior service and support across all the contact points a customer chooses.

The Three Phases of CRM

CRM can be viewed as an integrated system of Web-enabled software tools and databases accomplishing a variety of customer-focused business processes that support the three phases of the relationship between a business and its customers.

• **Acquire** – a business relies on CRM software tools and databases to help it acquire new customers by doing a superior job of contract management, sales prospecting, selling, direct marketing, and fulfilment.

o The goal of these CRM functions is to help customers perceive the value of a superior product offered by an outstanding company.

• **Enhance** – Web-enabled CRM account management and customer service and support tools help keep customers happy by supporting superior service from a responsive networked team of sales and service specialists and business partners. CRM sales force automation and direct marketing and fulfilment tools help company's cross-sell and up-sell to their customers, thus increasing their profitability to the business.

o The value perceived by customers is the convenience of one-stop shopping at attractive prices.

• **Retain** – CRM analytical software and databases help a company proactively identify and reward its most loyal and profitable customers to retain and expend their business via targeted marketing and relationship marketing programs.

o The value perceived by customers is of a rewarding personalized business relationship with "their company".

Benefits and Challenges of CRM

• CRM allows a business to identify and target their best customers; those who are the most profitable to the business, so they can be retained as lifelong customers for greater and more profitable services.

• CRM enables real-time customization and personalization of products and services based on customer wants, needs, buying habits, and life cycles.

• CRM can keep track of when a customer contacts the company, regardless of the contact point.

• CRM enables a company to provide a consistent customer experience and superior service and support across all the contact points a customer chooses.

CRM Failures:

• Major reason for the failure of CRM systems is the lack of understanding and preparation.

16.3.ENTERPRISE RESOURCE PLANNING:

Enterprise resource planning (ERP) systems serve as a cross-functional enterprise backbone that integrates and automates many internal business processes and information systems within the manufacturing, logistics, distribution, accounting, finance, and human resource functions of a company.

Enterprise Resource Planning:

Enterprise resource planning (ERP) is a cross-functional enterprise system that serves as a framework to integrate and automate many of the business processes that must be accomplished within the manufacturing, logistics, distribution, accounting, finance, and human resources functions of a business. Characteristics of ERP software include:

• ERP software is a family of software modules that supports the business activities involved in vital back-office processes.

• ERP gives a company an integrated real-time view of its core business processes.

• ERP systems track business resources, and the status of commitments made by the business no matter what department has entered the data into the system.

• ERP software suites typically consist of integrated modules of manufacturing, distribution, sales, accounting, and human resource applications.

<u>Benefits and Challenges of ERP</u>

- **Quality and efficiency** – ERP creates a framework for integrating and improving a company's internal business processes that results in significant improvements in the quality and efficiency of customer service, production, and distribution.

- **Decreased costs** – many companies report significant reductions in transaction processing costs and hardware, software, and IT support staff compared to the non-integrated legacy systems that were replaced by their new ERP systems.

- **Decision support** – ERP provides vital cross-functional information on business performance quickly to managers to significantly improve their ability to make better decisions in a timely manner across the entire business enterprise.

- **Enterprise agility –** ERP can be used in breaking down many former departmental and functional walls, which results in more flexible organizational structures, managerial responsibility, and work roles. The result is a more agile and adaptive organization and workforce that can more easily capitalize on new business opportunities.

Costs and risks involved in implementing ERP are considerable.

- Hardware and software costs are a small part of the total costs. The costs of developing new business processes (reengineering) and preparing employees for the new system (training and change management) make up the bulk of implementing a new ERP system.
- Converting data from previous legacy systems to the new cross-functional ERP system is another major category of ERP implementation costs.

Causes of ERP Failures:

• Business managers and IT professionals underestimate the complexity of the planning, development, and training that are needed to prepare for a new ERP system that would radically change their business processes and information systems.

• Failure to involve affected employees in the planning and development phases and change management programs

• Trying to do too much too fast in the conversion process.

• Insufficient training in the new work tasks required by the ERP system.

• Failure to do enough data conversion and testing.

• Overreliance by company or IT management on claims of ERP software vendors or the assistance of prestigious consulting firms hired to lead the implementation.

16.4. SUPPLY CHAIN MANAGEMENT:

Fundamentally, supply chain management helps a company get the right products to the right place at the right time, in the proper quantity and at an acceptable cost. The goal of SCM is to efficiently manage this process by forecasting demand; controlling inventory; enhancing the network of business relationships a company has with customers, suppliers, distributors, and others; and receiving feedback on the status of every link in the supply chain. To achieve this goal, many companies today are turning to Internet technologies to Web-enable their supply chain processes, decision-making, and information flows.

Supply Chain Management:

Supply chain management is a cross-functional interenterprise system that uses information technology to help support and manage the links between some of a company's key business processes and those of its suppliers, customers, and business partners. The goal of SCM is to create a fast, efficient, and low-cost network of business relationships, or supply chain, to get a company's products from concept to market.

According to the Advanced Management Council, supply chain management has three business objectives:

• Get the right product to the right place at the least cost.

• Keep inventory as low as possible and still offers superior customer service.

• Reduce cycle times. Supply chain management seeks to simplify and accelerate operations that deal with how customer orders are processed through the system and ultimately filled, as well as how raw materials are acquired and delivered for manufacturing processes.

The Role of SCM

SCM supports the objectives of the top three management levels of an organization (strategic, tactical, and operational). The role of information technology in SCM is to support these objectives with enterprise information systems that produce many of the outcomes a business needs to effectively manage its supply chain.

Benefits and Challenges of SCM

Major business benefits that are possible with effective supply chain management systems include:

• Faster, more accurate order processing, reductions in inventory levels, quicker time to market, lower transaction and materials costs, and strategic relationships with suppliers.

• Companies can achieve agility and responsiveness in meeting the demands of their customers and the needs of their business partners.

Major business challenges include:

• Lack of proper demand planning knowledge, tools, and guidelines is a major source of SCM failure.

• Inaccurate or overoptimistic demand forecasts will cause major production, inventory, and other business problems, no matter how efficient the rest of the supply chain management process is constructed.

• Inaccurate production, inventory, and other business data provided by a company's other information systems are frequent causes of SCM problems.

• Lack of adequate collaboration among marketing, production, and inventory management departments within a company, and with suppliers, distributors, and others.

• SCM software tools are considered to be immature, incomplete, and hard to implement by many companies who are installing SCM systems.

Trends in SCM

Three possible stages in a company's implementation of SCM systems.

• **First stage** – a company concentrates on making improvements to its internal supply chain process and its external processes and relationships with suppliers and customers.
• **Second stage** – a company accomplishes substantial supply chain management applications by using selected SCM software programs internally, as well as externally via intranet and extranet links among suppliers, distributors, customers, and other trading partners.
• **Third stage** – company begins to develop and implement cutting-edge collaborative supply chain management applications using advance SCM software, full-service extranets links, and private and public e-commerce exchanges.

16.5.SUMMARY:

This modules explains the different functionalities of CRM along with the goals, benefits and failures. It also discusses the role and benefits, trends and challenges of SCM. This unit also discusses about the ERP and it causes.

16.6.KEY WORDS:

Characteristics of ERP, Supply chain management, Benefits, challenges, customer Relationship management.

16.7. EXERCISE:

1. Explain ERP and what the causes for its failures are.

2. Explain the different trends of ERP.

3. Explain the different stages of SCM.

4. Explain the benefits and challenges of SCM.

5. Explain CRM. Bring out the benefits of CRM in business applications.

16.8. REFERENCES:

1)Waman S.Jawadekar ,"Management Information Systems", VIth Edition, Tata McGraw-Hill publication, 2008.

2. Gordon B.Davis & Margrethe H.Olson " Management Information systems, 2nd edition Tata MC-Graw HILL.

3) O'Brien, Management Information Systems,2nd edition, Galgotia publications, 1990