BALAJI INSTITUTE OF I.T AND MANAGEMENT KADAPA

MANAGEMENT INFORMATION SYSTEMS

(21E00106)

ICET CODE: BIMK

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1ST & 2ND INTERNAL EXAM

Name of the Faculty: A.AMAL

Units covered: 1-5 UNITS

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

Course Code	MANAGEMENT INFORMATION SYSTEMS	L	T	P	C
21E00106		4	0	0	4
	Semester	**I**			

Course Objectives:

- To provide the basic concepts of data and Management Information System and utility of the MIS for the managerial decisions.
- To Explain Management of Information system, MIS design and implementation process in an organisation.
- To discuss security, ethical and social issues in management of Information system.

Course Outcomes (CO): Student will be able to

- Know Management of Information system scope, application and challenges in managing MIS.
- Understand traditional and modern approaches for data resource management and models.
- Evaluate product based and process based cost and benefit to implement and maintain MIS in an organization.

UNIT - I	Lecture Hrs: 8

MIS An overview- Introduction, Need for MIS and IT nature and scope of MIS, MIS characteristics, Structure of MIS, role of MIS in global business. Challenges of Managing MIS.

UNIT - II	Lecture Hrs: 12

Data resource management- Data base concepts, The traditional approaches, the modern approaches (Data base management approaches) DBMS, Data models, Data ware housing and mining.

UNIT - III	Lecture Hrs:12

Business application of IS- Enterprise systems, ERP, CRM, SCM, DSS, Types of decisions, Decision support techniques, Decision making and Role of MIS, Business intelligence and Knowledge management systems.

UNIT - IV	Lecture Hrs:12

Management of IS- Project planning, SDLC, System development models, Project management, system analysis, system design, Implementation process, Product based MIS evaluation, Cost /Benefit based evaluation, Process based calculation, System maintenance

UNIT - V	Lecture Hrs:12

Security, Ethical &Social Issues : IS security threats, Protecting IS,IS Security Technologies, The disaster recovery plan, IS Ethical Issues, social issues.

Textbooks:

1. MIS –Managerial Perspective, D.P.Goyal,Vikas Publications.
2. Management Information Systems Text & Cases, W S Jawadekar, Tata McGraw-Hill.

Reference Books:

1. Management Information Systems, C Laudon and Jane P.Laudon, et al, Pearson Education.
2. MIS, Hossein Bidgoli, Nilanjan Chattopadhyay, Cengage Learning
3. Introduction to Information Systems, Rainer, Turban, Potter, WILEY-India.
4. Management Information Systems, James A. Obrein, Tata McGraw-Hill .
5. Cases in MIS, Mahapartra,PHI.
6. Management Information Systems, Gordon B. Davis & Margrethe H.Olson, Tata McGraw-Hill .

Online Learning Resources:

https://onlinecourses.nptel.ac.in/noc20_mg60/preview
https://nptel.ac.in/courses/110/105/110105148/
https://onlinecourses.swayam2.ac.in/cec21_ge05/preview

UNIT-1: MIS AN OVERVIEW

1.1 INTRODUCTION:

A **management information system** (**MIS**) is an **information system** used for decision-making, and for the coordination, control, analysis, and visualization of information in an organization.

The study of the management information systems involves people, processes and technology in an organizational context.

In a corporate setting, the ultimate goal of the use of a management information system is to increase the value and profits of the business. This is done by providing managers with timely and appropriate information allowing them to make effective decisions within a shorter period of time.

A **Management Information System** (**MIS**) is a computer **system** consisting of hardware and software that serves as the backbone of an organization's operations.

An **MIS** gathers data from multiple online **systems**, analyzes the **information**, and reports data to aid in **management** decision-making.

The purpose of an information system is to help an organization to manage its business better. In the past, both business and management are very simple; because of very low competition. Whereas today due to high level of competition both doing business and management have grown to unpredictable levels of complexity (difficulty).

1.1.1 MIS DEFINITION:

Management Information System or 'MIS' is a planned system of collecting, storing, and disseminating data in the form of information needed to carry out the functions of management. **(OR)**

The system which gives Information to the Management for making effective decisions in an Organization.

1.1.2 MIS IS AN ACRONYM OF THREE WORDS

1. Management
2. Information/processed data

3. Systems

1. **Management**: It covers the planning, control and administration of the operations of a concern.

Types of Management:

a. **Top Level** Management: handle planning.

b. **Middle Level** Management: concentrates on controlling

c. **Low Level** Management: concerned with actual administration

Management has been defined variously by different scholars.

However, **According to scholar Koontz's "management is the art of getting things done through the people."**

However, a manger alone cannot get things done through a magic stick. Instead he can perform with the help of managerial functions in a systematic way.

Fig: Levels of management hierarchy.

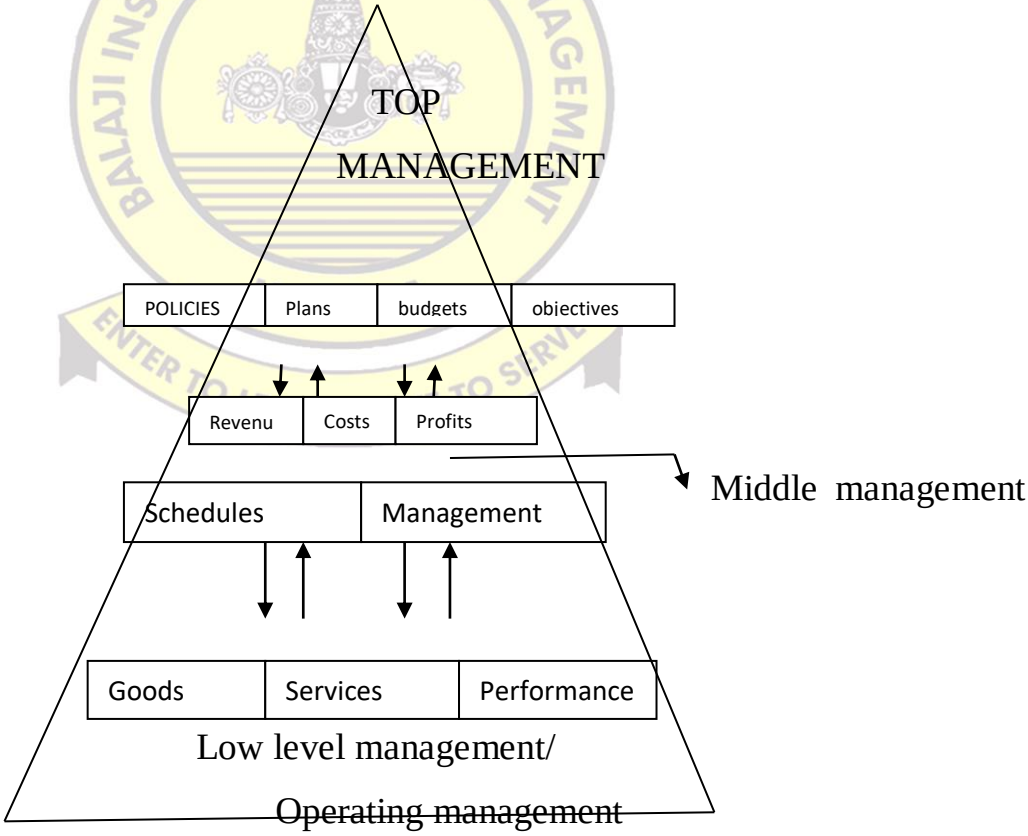


Fig: Interactions of the Three Levels of Management

2. Information/Processed Data:

Information is considered as a valuable resource required by the management in order to run a business organization. Information is data that is processed and is presented in desired format to help managers for decision making.

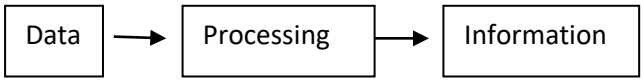
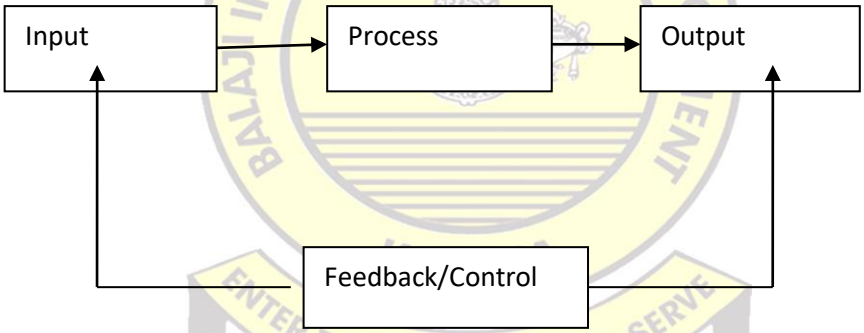


Fig: 1: Relation of data to information

3. Systems:

A system has one or multiple input (S); these inputs are processed through a transformation process to convert this input (S) into outputs (S).

FIG : System



For example: In a manufacturing organization, raw material is input to a system, which is processed by using various organizational processing techniques to convert input into output (final product)

1.1.3 HOW IS A MIS USEFUL IN COMPANIES:

Management information systems provide the owner and other decision-makers at a business with the data needed to make informed decisions for the company. A MIS provides background, current data and trend analysis so you have ready information on all areas of the business. You can use this detailed data on the company environment and finances to improve business performance in the long and short-term.

MIS is useful in companies in many ways like:

- ✓ Planning and control

- ✓ MIS encourages decentralization
- ✓ Cost effective
- ✓ MIS brings coordination
- ✓ MIS minimize information overload.

1.1.4 IMPACT OF MIS:

With a good MIS support, the management of marketing, finance, production and personnel becomes more efficient.

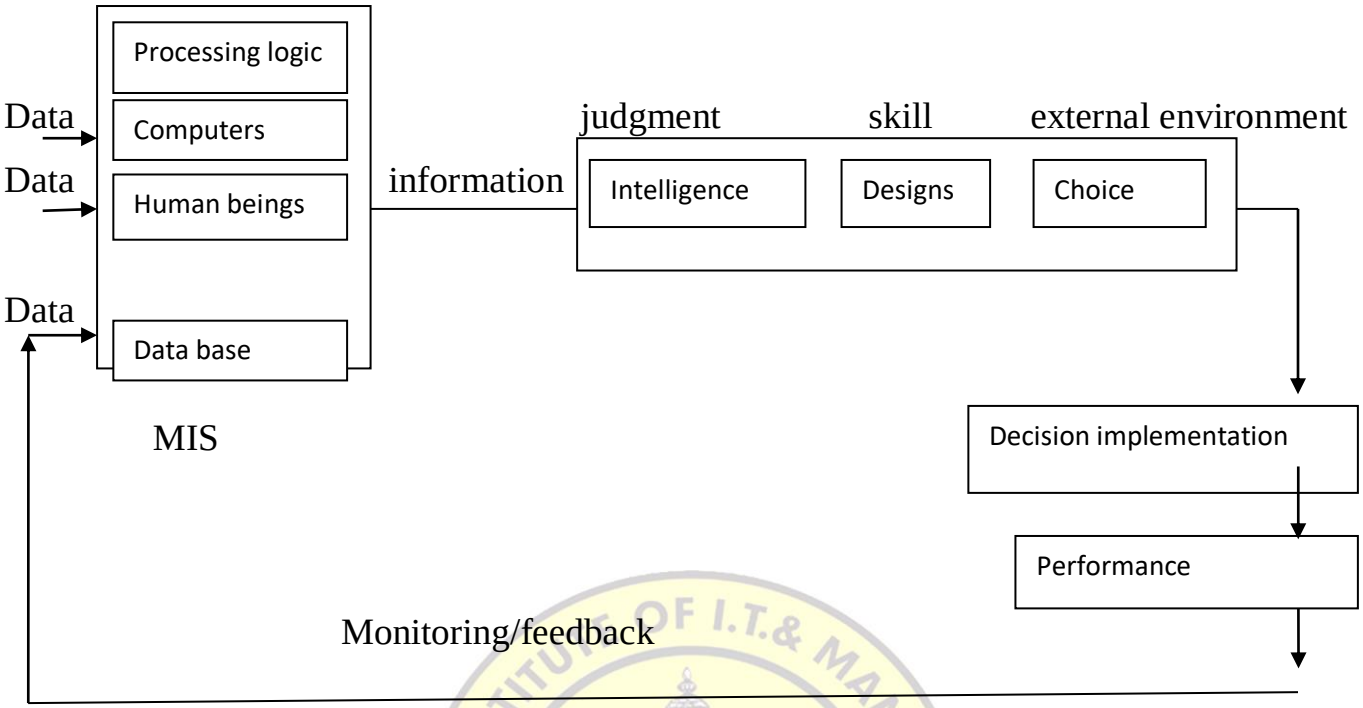
- ➢ MIS improves the administration of the business by bringing a discipline in its operations as everybody is required to follow and use systems and procedures.
- ➢ High degree of professionalism.
- ➢ MIS provides support to managers as they work to achieve corporate goals.

Finally, through MIS, the information can be used as a strategic weapon to counter the threats to business.

1.1.5 WHAT IS MIS :

- Right information
- To the right person
- At the right place
- At the right time
- In the right form
- At the right cost

FIG: MIS OVER VIEW



- MIS = people + process
- Problem solving (all skill people together and solve their complex problems)

1.2 NEED FOR MANAGEMENT INFORMATION SYSTEM (MIS):

MIS has more importance in today's global business environment because of the three main challenges.

1. Because of **liberalization and globalization**, in which organizations are required to compete not locally but globally, a manager has to take quick decisions, otherwise his business will be taken away by his competitors.
2. In this information age, where information is doubling, a manager has to process voluminous data, failing which he may end up taking a wrong decision that may prove costly for the company.A world is full of loads of information, to manage all these data we need MIS.
3. Now-a-days Information Technology (IT) is longer a luxury; rather it has become a **necessity**.

(It can be used in achieving business strategic advantages)

1.2.1 MIS NEED FOR INFORMATION SYSTEMS

Managers make decisions. Decision-making generally takes a four-fold path −

1) Understanding the need for decision or the opportunity,
2) Preparing alternative course of actions,
3) Evaluating all alternative course of actions,
4) Deciding the right path for implementation.

1.2.2 ROLE OF MNANAGEMENT INFORMATION SYSTEM:

1. It Support the business process and operations of an organization.
2. It Support decision-making by employees and managers of an organization.
3. It Support the strategies of an organization for gaining competitive advantage.

MIS is need for every organization, irrespective of their,

a) Functional area (finance, HR, marketing ,IT)
b) Responsibility in an organization (top, middle, low level management)
c) Size of an organization (small, medium or large)
d) Type of organization (private, GOVT)

1.2.3 CAPABILITIES:

1. Capturing data from different sources (accurately and quickly)
2. It processes voluminous data quickly
3. Providing accurate information
4. Storing huge amount of information
5. Fast and inexpensive access to large amount of information worldwide.
6. Increasing the efficiency and effectiveness of managers.
7. Allowing an organization to become more flexible and responsive.

1.2.4 BENEFITS OF MIS:

1. Reduced man power
2. Reduced cycle time
3. Reduced carrying cost of inventory
4. Reduced data transfer time

5. Reduced errors and increase accuracy
6. Improved decision making capability
7. Improved customer satisfaction
8. Reduced quality cost.

1.2.5 FUNTIONS OF MIS:

The main managerial functions are:

i) **Planning**: It includes laying down policies, procedures, rules, programs after setting goals and objectives to achieve them.
ii) **Organizing**: organization of tasks is done by dividing activities, assigning duties and delegating authorities.
iii) **Staffing**: it is the process of putting the right person at the right job.
iv) **Directing**: directing the people in order to achieve pre-determined goals and objectives.
v) **Controlling**: Managers control the performance of work by setting performance standards.

MIS is set up by an organization with the prime objective to obtain management **information** to be used by its managers in decision-making. **Thus, MIS must perform the following functions in order to meet its objectives.**

1) Data Capturing:

MIS captures data from various internal and external sources of an organization. Data capturing may be manual or through **computer** terminals. End users, typically record data about transactions on some physical medium such as paper form or enter it directly into a **computer** system.

2) Processing of data:

The captured data is processed to convert it into the required management information. Processing of data is done by such activities as calculating, comparing, sorting, classifying and summarizing.

3) Storage of information:

MIS stores processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organizational record. In this activity, data and information are retained in an organized manner for later use. Stored data is commonly organized into fields, records, files and databases.

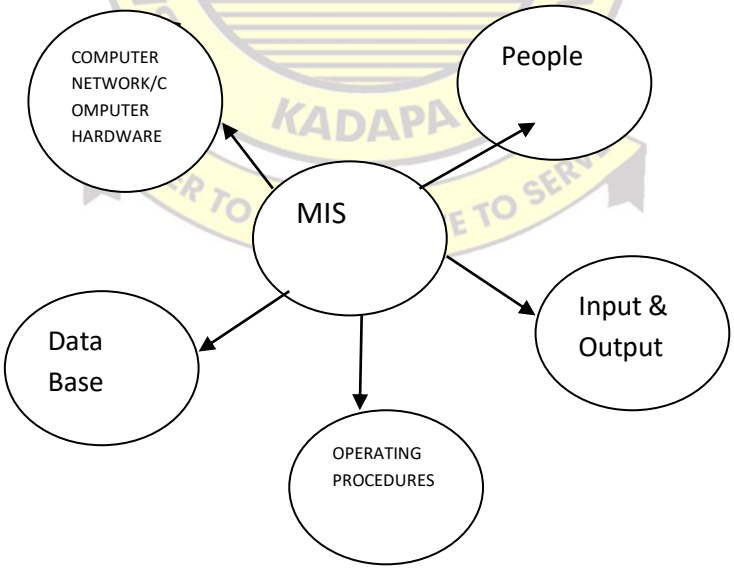
4) Retrieval of information:

MIS retrieves information from its stores as and when required by various users. As per the requirements of the management users, the retrieved information is either disseminated as such or it is processed again to meet the exact demands.

5) Dissemination of MI:

Management information, which is a finished product of MIS, is disseminated to the users in the organization. It could be periodic, through reports or on-line through computer terminals.

1.2.6 COMPONENTS OF MIS:



1.3 IT NATURE AND SCOPE OF MIS:

1.3.1NATURE OF MIS

There has been a lot of debate on the issue whether MIS is more management oriented or computer oriented though there are advocates (supports) of both the sides, MIS should be

considered more of a management subject than of computers because of simple logic that computers are just a tool in the hands of managers.

The below figure refers both science subjects and arts subjects So MIS called as interdisciplinary in nature.

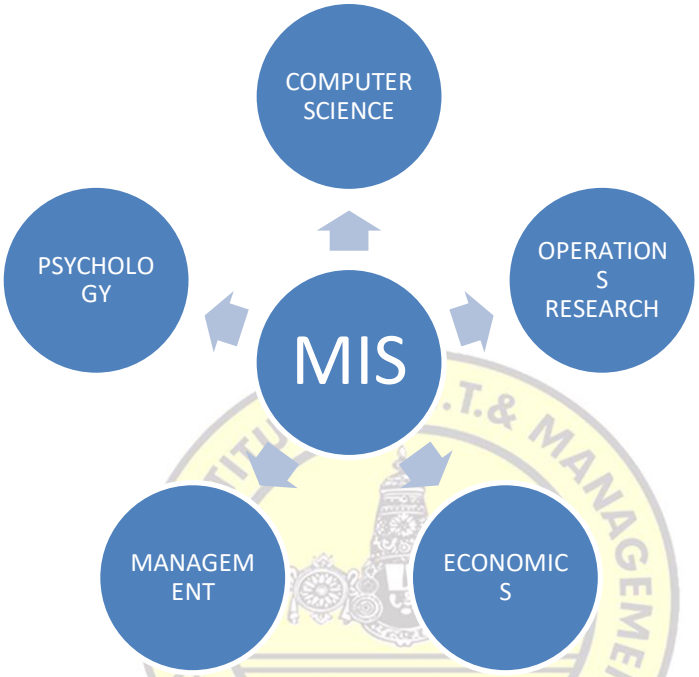


Fig: Interdisciplinary Nature of MIS

Management Information Systems (MIS) can be simply referred to as a system or process that facilitates the smooth working of the organisation. The nature of MIS is truly multifold because it plays a bigger role in business decisions, from costs to employee management.

Here are the major features that portray the nature of MIS:

- MIS is utilised by every level of a management.
- It clarifies and focuses on the strategic goals and objectives for the management.
- MIS provides an effective system to analyse costs and revenues and further reviews effectively and efficiently to bring a balanced in finances and costs.
- MIS is maintained either through manual systems or automated systems or a combination of both.
- It also plays a incremental role in identifying, locating, measuring, tackling and limiting risks.

- It lays down a framework of rules and regulations for the management to bring a clear and concise communication between employees.
- MIS provides an objective system of collecting, assessing and aggregating information for a business.

1.3.2 SCOPE (EXTENT OF AREA) OF MIS

After understanding what MIS is, we move on to the scope of MIS. Information Systems is growing at a fast pace to become one of the most promising career fields in today's world. With everything happening digitally, the demand for MIS professionals is increasing more than ever. MIS involves performing a number of tasks simultaneously such as-

- **Processing data**
- **Initiating transactions**
- **Responding to inquiries**
- **Producing reports and its summaries**
- **Manage the data created within the structure of a particular business**

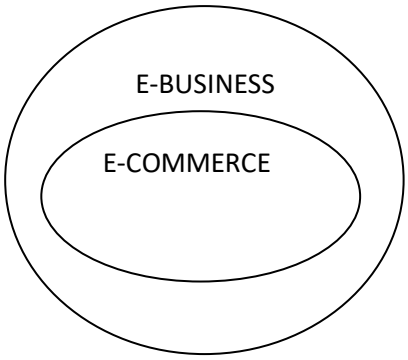
MIS acts in an organization just like a nervous system in a body by providing with the relevant information for ease in the **process of decision making.**

The purpose of MIS is to work towards satisfying the information needs of everyone in the business. It means providing the relevant information to those who need it.

Thus, MIS has a lot of potential to become one of the most promising careers for individuals interested in the workings of a business.

- ✓ MIS caters to information needs of managers in an organization, thus its scope lies in structured as well as unstructured type of information which could be gathered from internal as well as external sources of the organization.
- ✓ With the advent of computers and communication technology (CCT), the scope of MIS has increased a lot.

- ✓ Though you find manual information systems (such as pencils, papers or calculators) to convert raw data into information. However because of high potential of computers and CCT organizations would like to make use of advanced CCT.
- ✓ Digital Organization, E-Commerce



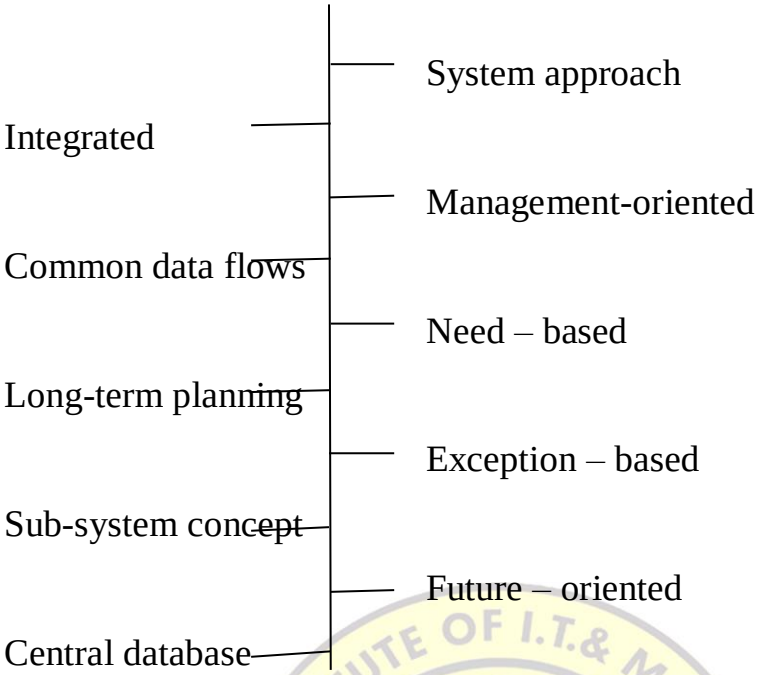
E-Commerce: Buying and selling of goods and services with the use of electronic systems (such as computers) over the internet.

E-Business: a company that does all or most of its transactions through the internet.

Distinguish between E-Commerce And E-Business

E-Commerce	E-business
1. E-commerec involves commercial transactions done over internet.	1. E-business is conduct of business processes on the internet
2. E-commerce is subset of E-business.	2. E-business is superset of E-business.
3. E-commerce usually requires the use of just a website.	3. E-business involves the use of CRM'S, ERP'S that connect different business processes.
4. E-commerce just involves buying and selling of products and services.	4. E-business includes all kind of pre-sale and post-sale efforts.
5. E-commerce is narrower concept and restricted to buying and selling.	5.It is a broader concept that involves market surveying, supply chain and logistic management and using datamining.
6. It is more appropriate in B2C context.	6. It is used in the context of B2B transactions.
7. E-commerce involves the mandatory use of Internet.	7. E-business can involve the use of internet, intranet or extranet.
8. Example : Buying of pendrive from Amazon.com,alibaba.com is considered ecommerce.	8.Example : Using of internet by dell, Amazon for maintaining business processes like. Online customer support, email marketing supply chain management.

1.4. MIS CHARACTERISTICS:



1. SYSTEM APPROACH

- It means taking a complete look at the interlocking sub-systems that operate within an organization.
- The system approach implies a holistic approach to the study of system and its performance in the light of the objective for which it has been constituted.

2. MANAGEMENT ORIENTED

- Top-down approach flowed.
- Management-oriented characteristic of MIS implies that the management actively directs the system development efforts.
- Manager should spend a good amount of his/her time in system design.

3. NEED-BASED

- MIS caters specific needs of managers

- MIS design and development should be as per the information needs of managers at different levels, i.e.(top) strategic planning level,(middle) management control level and (low)operational control level.

4. EXCEPTION-BASED

- Exception-based reporting means an abnormal situation i.e. maximum, minimum or expected values vary beyond tolerance limits.
- In such cases, there should be exception reporting to the decision-maker at the required level.

5. FUTURE-ORIENTED

- MIS not only provide past information but also it predicts future on the basis of projections.

6. INTEGRATED

- It is significant because of its ability to produce more meaningful, information.
- For example, in order to develop an effective production scheduling system, it is necessary to balance such factors as,

- Set-up costs
- Workforce
- Overtime rates
- Production capacity
- Inventory level
- Capital requirements
- Customer services

- ✓ **INTEGRETED MEANS** – taking a complete look at the complete picture of the interlocking sub-systems that operates within the company.
- ✓ Thus, an integrated system that blends information from several operational areas is a necessary characteristic of an MIS

✓ Opportunity to avoid duplication and redundancy in data gathering, storage and dissemination.

7. COMMON DATA FLOWS

- The development of common data flow, is an economically sound and logical concept, but it must be viewed in a practical light.
- **For example**, customer orders are the basis for billing the customer. For the goods ordered, setting up accounts receivables, initiating production activity, sales analysis, sales forecasting etc.
- It is necessary to capture and use this data throughout the functional areas.

8. LONG-TERM PLANNING

- The MIS designer must have the future objectives and needs of the company in mind.
- MIS is developed over relatively long periods such systems do not develop overnight.

9. SUB-SYSTEM CONCEPT

- MIS is complex and one is likely to look insight frequently.
- Thus the system, though viewed as single entity, must be broken down into digestible subsystems, which are more meaningful at the planning stage.

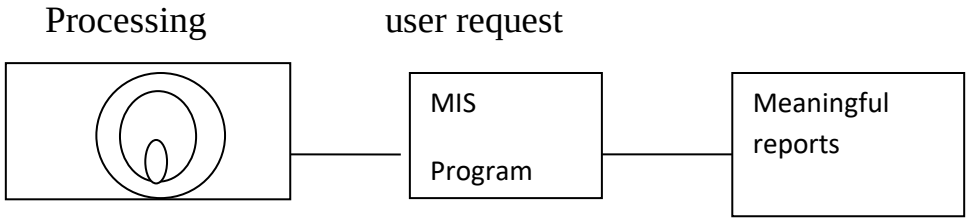
10. CENTRAL DATABASE

- It is the mortar that holds the functional system together.
- If the data is stored efficiently and with common usage in mind, one master file can provide the data needed by any of the functional system.

1.5 STRUCTURE OF MIS:

- MIS uses data from the transaction processing files within MIS program.

- MIS programs are tools that help to manipulate the raw data into meaningful reports that a user can request.



- Structure of MIS is a difficult concept to understand because there is no standard or universally accepted framework for describing MIS.
- Different approaches may be used while describing an entity.

  For example, car may be perceived in a number of different ways,

  a. Physical characteristics – shape, colour, doors, seating capacity etc.
  b. Component system – engine
  c. Major use – passenger car, sports car etc.
- Each of above approaches would provide an understanding to the person about the car.
- Similarly, a department may be understood in terms of its,

a. Functions like sales, advertising, and market research.
b. Organizational structure – marketing department, Marketing manager, Sales officer.

- Thus, multiple approaches help in describing the structure of an entity in a better way.

MIS Structure May be Described By Following A Variety of Different Approaches:

1. Physical components
2. Decision support
3. Levels of management activities
4. Organizational functions and management activities.

1. MIS STRUCTURE BASED ON PHYSICAL COMPONENTS:

The physical components of MIS may be hardware, software, database, manual procedures and operating persons.

2. DECISION SUPPORT

- The structure of MIS can also be described on the basis of its support in decision making in an organization.
- A highly structured decision can be pre-planned, where as highly unstructured decision cannot.
- The structured, programmable decision tends to be routine and frequently repeated.

3. LEVELS OF MANAGEMENT ACTIVITIES

A. Strategic planning

B. Management control level

C. Operational control level

a. STRATEGIC PLANNING LEVEL (long range considerations)

It includes – business directions, market strategy, product mix etc.

b. MANAGEMENT CONTROL LEVEL

It includes acquisition and organization of resources, structuring of work and acquisition and training of personnel.

c. OPERATIONAL CONTROL LEVEL (short term decisions for current operations)

- It includes pricing, production levels, inventory levels etc.
- The information systems would be different for the three levels of management hierarchy.

4. ORGANIZATIONAL FUNCTIONS

A typical set of functions in a manufacturing organization includes production, sales and marketing, finance and accounting, materials, personnel and information systems.

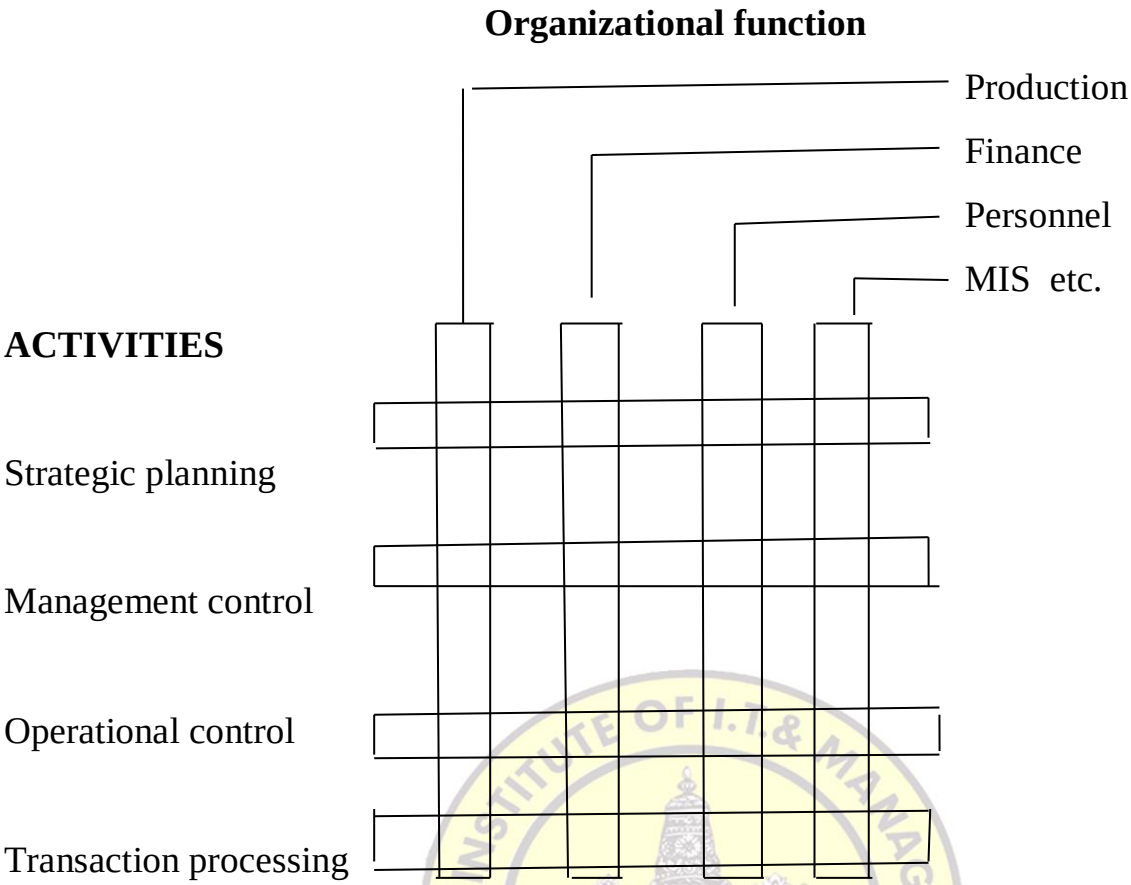
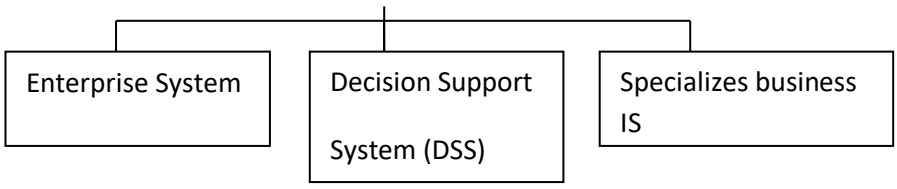


Fig: organizational functions and management activities.

1.6 ROLE OF MIS IN GLOBAL BUSINESS:

MIS plays a crucial role in almost all kinds of organizational irrespective of their size and nature of business.MIS has changed the way organizations do business and has increased their efficiencies and responsiveness.

The role of MIS can be categorized in three types,



1.6.1ENTERPRISE SYSTEM:

a. E-Commerce

b. M-Commerce

c. E-procurement

a. E-COMMERCE

Buying and selling of goods and services through electronic devices through internet is called E-Commerce (electronic commerce).

Example – online shopping, electronic payments, online auctions, internet banking and Online Ticketing.

Types of E-Commerce

1. Business to business (B2B)
2. Business to customers (B2C)
3. Customers to customers (C2C)
4. Business to employees (B2E)

Benefits of E-Commerce

It eliminates the limitations of time and geographical distance and low cost

b. M-COMMERCE

Buying and selling of goods and services through wireless hand held devices like mobiles, PDA, tabs etc.

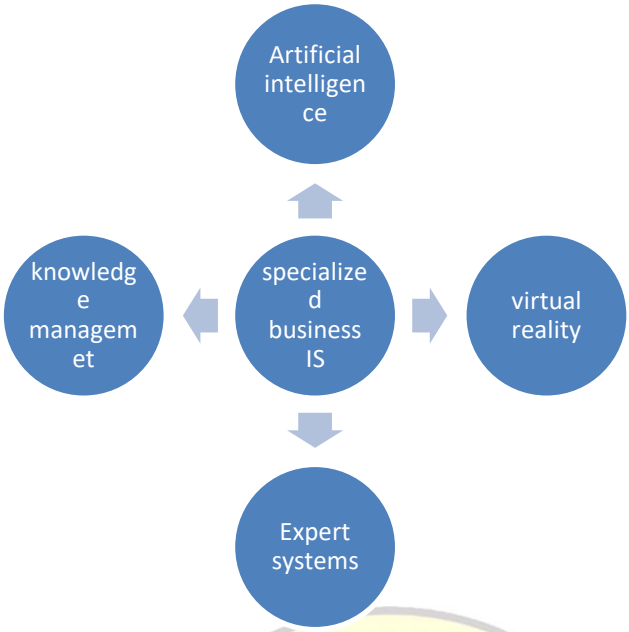
c. E-PROCUREMENT(Electronic Procurement)/Supplier exchange:

It is the B2B requisitioning ordering and purchasing of goods and services over the internet.

1.5.2 DECISION SUPPORT SYSTEM (DSS)

- Organized collection of people, procedures, software, databases and devices that support problem-specific decision making.
- It focuses mainly on effective decisions.
- It is used when problem is complex and information needed to determine appropriate action is difficult to obtain.

1.5.3 SPECIALIZED BUSINESS INFORMATION SYSTEM (IS)



KNOWLEDGE MANAGEMENT

It is nothing but organized collection of people, procedures, software, databases and devices to create, store, share, and use the organizations knowledge and experience.

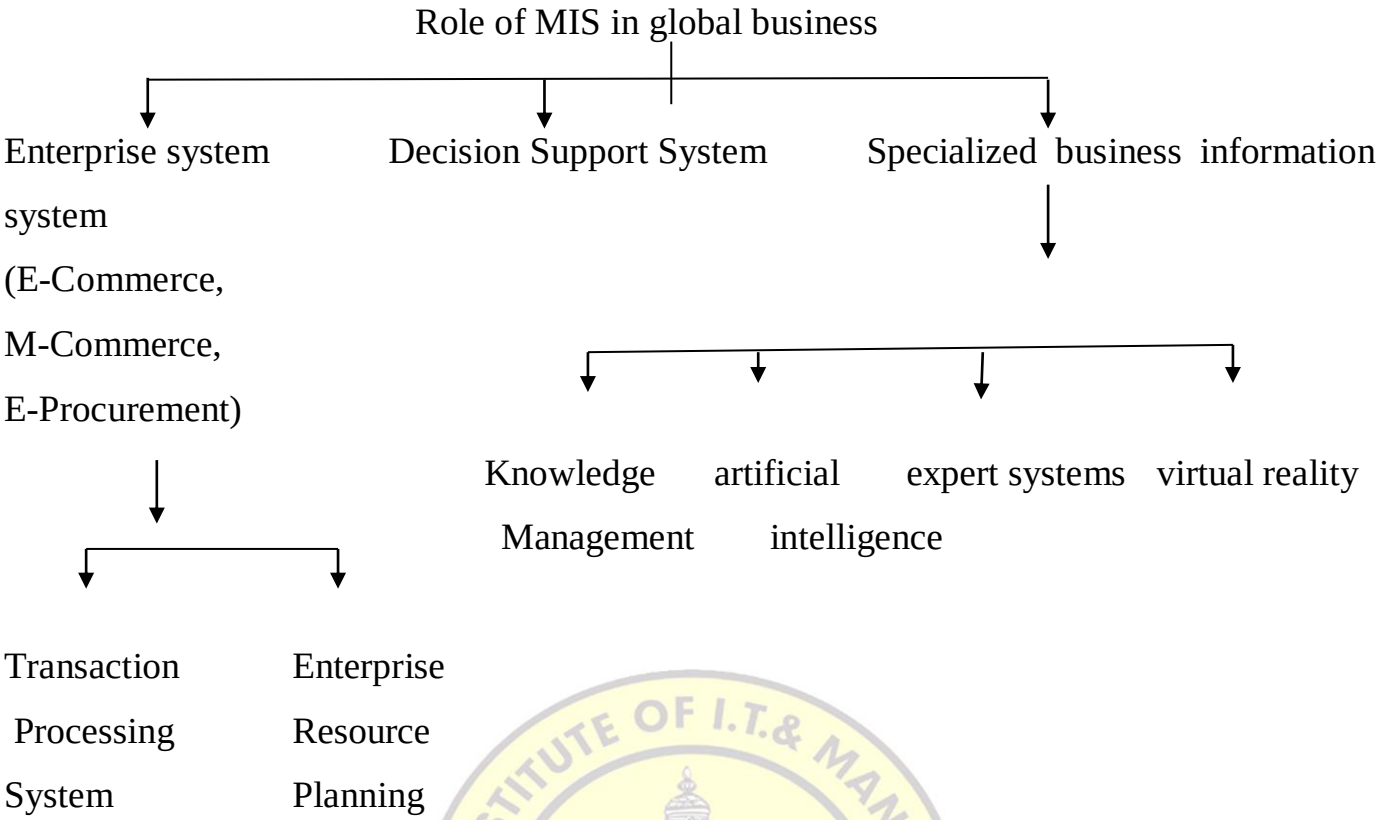
ARTIFICIAL INTELLIGENCE: It involves computer system takes on characteristics of human intelligence. (ROBO)

EXPERT SYSTEMS

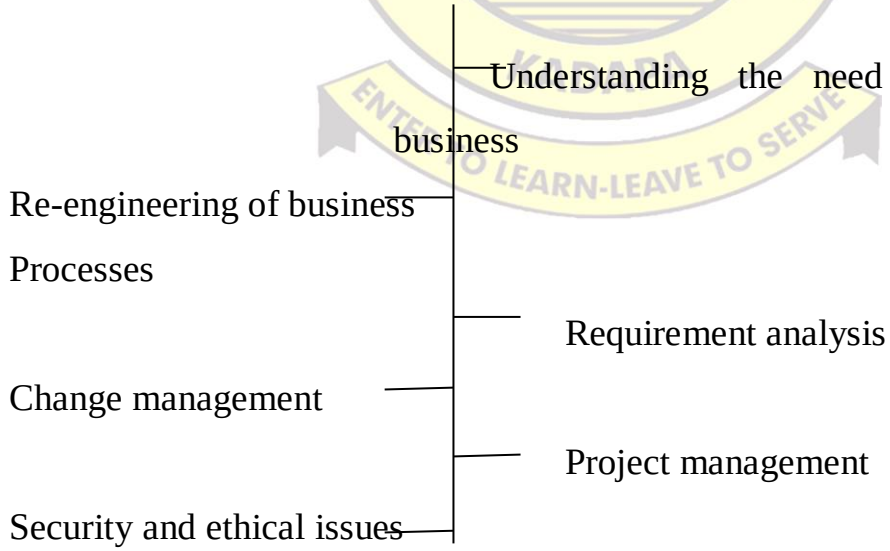
- It gives computer ability to make suggestions functions like an expert in a particular field.
- Knowledge base contains data, rules, procedures, and relationships used by expert systems.

VIRTUAL REALITY

It is nothing but simulation of a real or imagined environment that can be experienced visually in three dimensions.



1.6 CHALLENGES OF MANAGING MIS:



1. UNDERSTANDING THE NEED & ALIGNING MIS WITH BUSINESS

- The success of MIS depends significantly on understanding the need for an IS and aligning business with IS/IT.

- Generally IS are developed or acquired without understanding the specific needs of the organization for such systems.
- The goal of the IS and the reasons for implementing it, along with the subsystems or major tasks involved, are not always clearly defined.
- Many a time IS/IT systems are conceived which may not be aligned with the mission and goals of the organization.
- As a result, the ISs may not be contributing any value to the organization.

2. REQUIREMENT ANALYSIS

- Many a time, the manager (user) is not very clear about his/her requirements and thus it is left to the IT specialist, who does not know much about the business.
- Thus there remains a communication gap between the user and the IT specialist.
- As a result, the newly developed and implemented Information System(IS) does not later to the needs of the user.

3. PROJECT MANAGEMENT

- IS to be successful must be developed / implemented within time, budget and meet the quality standards.
- There may be many challenges in managing an IS/IT, as follows.
  a. Unrealistic deadlines
  b. Failure to manage risk
  c. Lack of project management skills
  d. Non-involvement of customers and end-users during the project.

4. RE-ENGINEEING OF BUSINESS PROCESSES

- Automation of the business process may not make the operation efficient and effective.
- Rather it is redesigning of the business processes that is more important to improve the performance of the business.

- Re-engineering of the business process would change the structure as well as the way an organization does its business and thus leading to change in the organizational culture.

5. CHANGE MANAGEMENT

- Integrated information systems like ERP systems, being a transformation and an expensive solution, it is not an easy decision, and thus needs to be deal with great care.
- ERP implementation is like a corporate equivalent of a brain transplant.
- The risk was certainly disruption of business, because if you do not ERP implementation experiences from different companies.

6. SECURITY AND ETHICAL ISSUES

- There is always a threat to the security of an IS which needs to be managed to protect data resources in an organization.
- Similarly managers are often challenged by the ethical responsibilities generated by the use of IS/IT

UNIT-1

PREVIOUS YEAR QUESTIONS

1. Discuss the nature and scope of management information system. Explain why information systems are so important for business today.**(Jan 2020-regular&supply)**

   (OR)

2. (a)Distinguish between data and information, information systems and computer systems.

   (b)State the challenges of managing information systems in today's business environment. **(Jan 2020-regular&supply)**

1. (a) Define 'Management Information System (MIS).Explain its need in business.

   (b)Illustrate the basic structure of MIS. **(October 2020 supply)** **(OR)**

2. (a) Describe the role of MIS in global business.

   (b)Highlight the important characteristics of MIS. **(October 2020 supply)**

1. What are the characteristics of MIS? Explain in detail types of MIS system. (**dec/Jan 2018/19 regular and supply**) **(OR)**

2. Explain how information system impacts on organizations and business firms**.(dec/jan 2018/19 regular and supply)**

1. Explain the scope and characteristics of MIS? **(OR)**
2. Discuss about the role of MIS in global business environment? **(dec/jan-2017/18-regular)**

1. Define MIS? Explain different stages of system development. **(dec-2017-supply)** **(OR)**
2. Enumerate the importance of management decisions? **(dec-2017-supply)**

EXTRA ANSWERS

1 (a)Distinguish between data and information, information systems and computer systems. (Jan 2020-regular&supply)

Differences between Data and Information

Data	Information
Data is unorganised raw facts that need processing without which it is seemingly random and useless to humans	Information is a processed, organised data presented in a given context and is useful to humans.
Data is an individual unit that contains raw material which does not carry any specific meaning.	Information is a group of data that collectively carry a logical meaning.

Data doesn't depend on information.	Information depends on data.
It is measured in bits and bytes.	Information is measured in meaningful units like time, quantity, etc.
Data is never suited to the specific needs of a designer.	Information is specific to the expectations and requirements because all the irrelevant facts and figures are removed, during the transformation process.
An example of data is a student's test score	The average score of a class is the information derived from the given data.

What is Data?

Data is the complete list of facts and details like text, observations, figures, symbols and description of things. It is the raw list of facts that are processed to gain information. The basic concept of data is associated with scientific research collected by different research organisations.

What is Information?

Information is the processed, organised and structured data. It provides context for data. However, both the terms are used together; information can be easily understood than data.

INFORMATION SYSTEMS AND COMPUTER SYSTEMS.

Computer system involves the design and development of all types of software from operating systems, it focuses on programming, data structures, and operating systems, while information systems focuses on how data is gathered, stored, and transformed into information.

Computer science focuses more heavily on the theory and mathematical foundations that serve as a basis for programming languages. On the other hand, computer information systems focus more on solving practical problems or improving processes with computing technology.

2. Explain in detail types of MIS system. (Dec/Jan 2018/19 regular and supply)

Types of Management Information System:

- Process Control :
- **Management Reporting System** :
- **Inventory control** :
- Sales and Marketing :
- Human resource (Enterprise collaboration/Office automation) :
- Accounting and finance :
- **Decision Support System** :
- Expert system

3. Define MIS? Explain different stages of system development. (dec-2017-supply)

Different Stages of System Development

1. Planning
2. System analysis and requirements
3. Systems design
4. Development
5. Integration and testing
6. Implementation
7. Operations and maintenance.

4**. Enumerate the importance of management decisions? (dec-2017-supply)**

IMPORTANCE OF MANAGEMENT DECISIONS

MEANING – Decision making is a process of selecting the best among the different alternatives.

It is the act of making a choice.

DEFINITION – It is defined as the selection of choice of one best alternative.

All alternatives should be evaluated before decision making.

IMPORTANCE

1. Implementation of managerial function
2. Pervasiveness of decision making
3. Evaluation of managerial performance
4. Helpful in planning and polices

5. Selecting the best alternatives.
6. Successful operation of business.

Prepared By

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ASSISTANT PROFESSOR

BALAJI INSTITUTE OF IT & MANAGEMENT

Icet Code: BIMK

SUBJECT: MANAGEMENT INFORMATION SYSTEM (MIS)

Regulation: R17

If you cannot find peace within yourself, you will never find it anywhere else.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

Course Code	MANAGEMENT INFORMATION SYSTEMS	L	T	P	C
21E00106		4	0	0	4
	Semester	**I**			

Course Objectives:

- To provide the basic concepts of data and Management Information System and utility of the MIS for the managerial decisions.
- To Explain Management of Information system, MIS design and implementation process in an organisation.
- To discuss security, ethical and social issues in management of Information system.

Course Outcomes (CO): Student will be able to

- Know Management of Information system scope, application and challenges in managing MIS.
- Understand traditional and modern approaches for data resource management and models.
- Evaluate product based and process based cost and benefit to implement and maintain MIS in an organization.

UNIT - I	Lecture Hrs: 8

MIS An overview- Introduction, Need for MIS and IT nature and scope of MIS, MIS characteristics, Structure of MIS, role of MIS in global business. Challenges of Managing MIS.

UNIT - II	Lecture Hrs: 12

Data resource management- Data base concepts, The traditional approaches, the modern approaches (Data base management approaches) DBMS, Data models, Data ware housing and mining.

UNIT - III	Lecture Hrs:12

Business application of IS- Enterprise systems, ERP, CRM, SCM, DSS, Types of decisions, Decision support techniques, Decision making and Role of MIS, Business intelligence and Knowledge management systems.

UNIT - IV	Lecture Hrs:12

Management of IS- Project planning, SDLC, System development models, Project management, system analysis, system design, Implementation process, Product based MIS evaluation, Cost /Benefit based evaluation, Process based calculation, System maintenance

UNIT - V	Lecture Hrs:12

Security, Ethical &Social Issues : IS security threats, Protecting IS,IS Security Technologies, The disaster recovery plan, IS Ethical Issues, social issues.

Textbooks:

1. MIS –Managerial Perspective, D.P.Goyal,Vikas Publications.
2. Management Information Systems Text & Cases, W S Jawadekar, Tata McGraw-Hill.

Reference Books:

1. Management Information Systems, C Laudon and Jane P.Laudon, et al, Pearson Education.
2. MIS, Hossein Bidgoli, Nilanjan Chattopadhyay, Cengage Learning
3. Introduction to Information Systems, Rainer, Turban, Potter, WILEY-India.
4. Management Information Systems, James A. Obrein, Tata McGraw-Hill .
5. Cases in MIS, Mahapartra,PHI.
6. Management Information Systems, Gordon B. Davis & Margrethe H.Olson, Tata McGraw-Hill .

Online Learning Resources:

https://onlinecourses.nptel.ac.in/noc20_mg60/preview
https://nptel.ac.in/courses/110/105/110105148/
https://onlinecourses.swayam2.ac.in/cec21_ge05/preview

UNIT-2
DATA RESOURCE MANAGEMENT (DATA ADMINISTRATION)

1. INTRODUCTION:

DATA RESOURCE MANAGEMENT (DRM):

DRM involves the management of files and computer data for businesses and companies.

- DRM is also known as data administration deals with computer science and information systems.
- Workers in this filed help design, control, protect, store, administer and organize saved data.
- Normally, this information is stored on data base with Data Base Management Systems (DBMS) or software.
- DRM is a managerial activity that applies IT and software tools to the task of managing an organizations data resources.
- Earlier, we use traditional file processing approach, which is too difficult ,costly and inflexible to supply the information.
- Thus DRM approach was developed to solve the problems of file processing systems.
- Data is an important input in an **IS**(Information System)
- **DATA RESOURCE** is also called the database.
- **DATA BASE**: Data is processed and converted into information to satisfy the needs of the organization.
- Now-a-days internal and external information was increasing rapidly so database was necessary in any organization.
- The business environment has forced the businesses to take quick and right decisions for which databases are required to be queried frequently.
- QUERIES may be varied,

EXAMPLES

1. One manager may be interested to know the names of all those products for which sales in the current year exceed that of the previous year.
2. One may require information on the total amount outstanding.
3. One may require the list of products having a market share greater than 30% and soon.

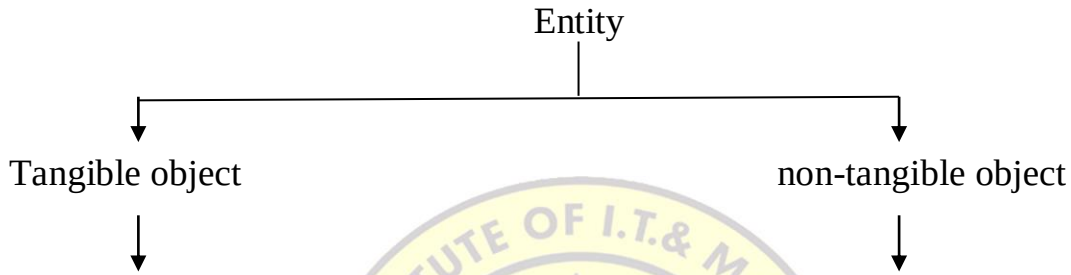
To correctly process varied types of queries and to ensure a fast response time, the use of computer based IS has become a necessity of any business.

2.1. DATA BASE CONCEPTS

Entity: A thing distinct and independent existence.

OR

Anything of interest to the user about which data is to be collected / stored is called entity.



Employee, a student, a spare part or a place event, a job title, a customer account

An entity can be described by its CHARACTERISTICS/FEATURES such as name, age, designation etc.

Attributes:

- The characteristics/features of entity are called attributes.
- Data is generally organized into characters, fields, records, files and databases, which is called The Logical Data Elements.

Explanation:

1. **CHARACTER:**
   - It consists of a single alphabetic, numeric, or other symbol, which is represented by Bit or Byte.
   - Character is the most BASIC ELEMENT of data
2. **FIELD :**
   - A collection of characters is called field.
   - A field is a physical space on the storage device.

For Example – the field in an employee may be employee name, sex, address etc.

Data Item – It is the data stored in the field.

Example – employee age, name is field.

The values in these field (Sandeep 26 years) – data items.

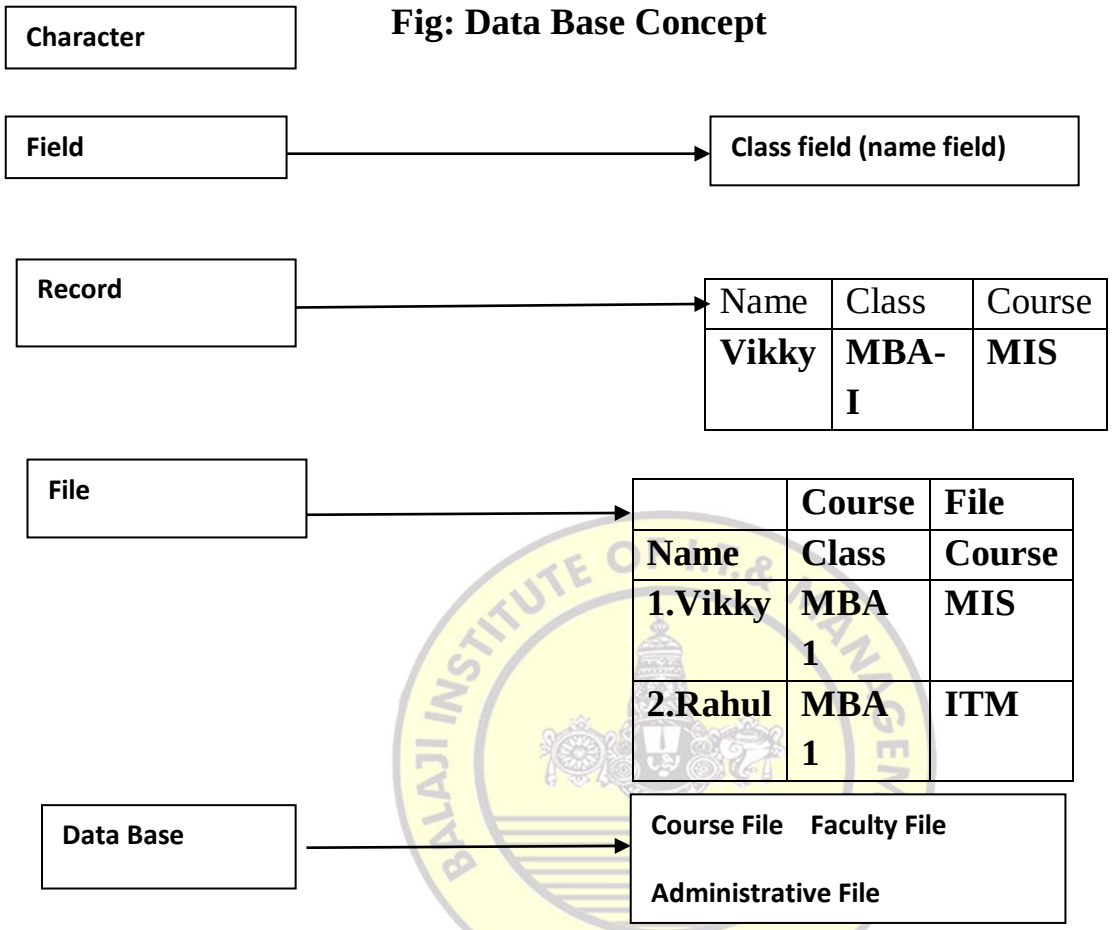


Fig: Data Base Concept

3. RECORD:

Collection of various related fields is called record

For example – student – name, address, roll-no, marks etc., will be a record of the student.

4. FILE:

A collection/ group of various records is known as a file.

OR

Any collection of related records in the form of rows and columns (tabular form) is called a file.

For example – If there are many students in a class, then a group of related records would form student – file.

5. DATA BASE

A collection of various related files is known as database.

OR

It is an organized collection of data, stored and accessed electronically.

An Information System (IS) application may have several related files and all related files would constitute a database for that application.

For example – In a salary processing system, the files may be employee-file, provident-fund-file, income-tax-file etc.

All these files, which are related to the application, are combined in a database.

2.2. THE TRADITIONAL APPROCHES:

Traditionally, data files were developed and maintained separately for individual applications .Every functional unit like marketing, finance, production etc. Used to maintain their own set of application programs and data files.

Problems with Traditional File Processing:

Traditional approach was rendered inadequate especially when organizations started developing organization-wide integrated applications.

1. Data duplication
2. Data inconsistency
3. Lack of data integration
4. Data dependence
5. Program dependence

1. DATA DUPLICATION:

Each application has its own data file, the same data may have to be recorded and stored in several files.

Example – payroll application, and personnel application, both will have data on employee name, designation etc. This results in unnecessary duplication/redundancy of common data items.

2. DATA INCONSISTENCY

- Data duplication leads to data inconsistency especially when data is to be updated.
- It occurs because the same data items which appear in more than one file do not get updated simultaneously in all the data files.
- For example – employees designation, which is immediately updated in the payroll system may not necessarily be updated in the personnel application.
- This result in two different designations of an employee at the same time.

3. LACK OF DATA INTEGRATION

- Because of independent data files, users face difficulty in getting information on any adhoc query (a non-standard inquiry).
- Thus, either complicated programs have to be developed to retrieve data from each independent data file or users have to manually collect the required information from various outputs of separate applications.

4. DATA DEPENDENCE

The applications in file processing systems are data dependence.

For example – In order to process applications, it needs files organized on customers records sorted on their last name, which implies that retrieval of any customer's record have to be through his/her last name only.

5. PROGRAM DEPENDENCE

- The reports produced by the file processing system are program dependent, implies that if any change in the format/structure of data and records in the file to be made, a corresponding change in the programs have to be made.
- Similarly, if any new report is to be produced, new programs will have to be developed.

It is because of all these drawbacks in the traditional files approach of organizing data that led to the development of data bases.

2.3.THE MODERN APPROACHES (DATA BASE MANGEMENT APPROACHES/SYSTEM) DBMS

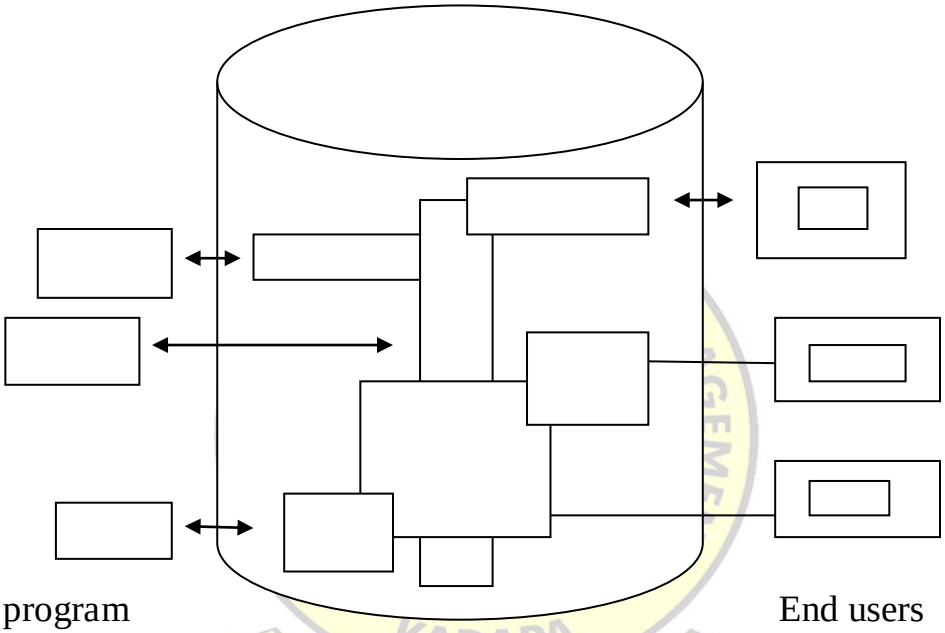
A database is a collection of various related files.

In a data base system – a common data is shared by a number of applications as it is data and program independent.

File processing system

- Data duplication
- Data inconsistency
- Lack of data integration
- Data dependence
- Program dependence

over come in DBMS



Fig; simplified view of a database systems

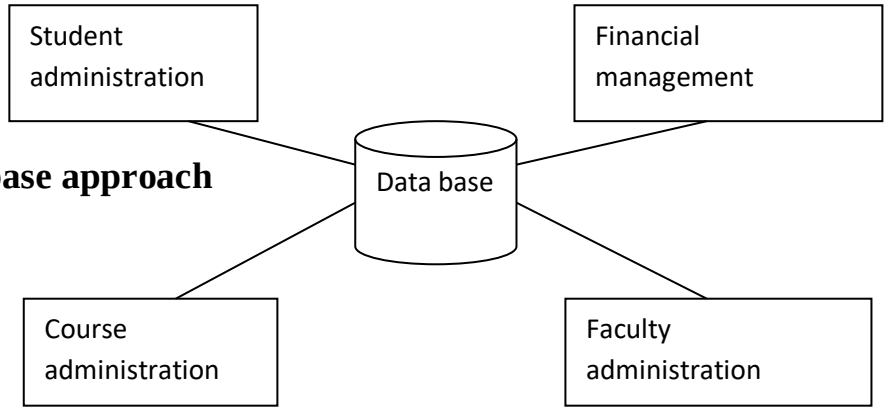


Fig: Data base approach

2.3.1 DBMS Definition:

The software that allows an organization to centralize data, manage it efficiently, and provides access to the database by application programs is known as DBMS.

- The DBMS thus solves the problems of the traditional file processing environment.
- The DBMS is the software that interacts with end users, applications and the database itself to capture and analyze data.

2.3.2 Objectives of DBMS

1. Controlled data redundancy
2. Enhanced data consistency
3. Data independence
4. Ease of use
5. Economical
6. Application independence
7. Recovery from failure

2.3.4 Advantages of DBMS:

1. Redundancy control
2. Data consistency
3. Management queries
4. Data independence
5. Enforcement of standards

1. REDUNDANCY CONTROL

- ✓ In a file management system, each application has its own data, which causes duplication of common data items in more than one file.
- ✓ This data duplication needs more storage space as well as multiple updations for a single transaction.
- ✓ This problem is overcome in database approach where data is stored only once.

2. DATA CONSISTANCY

In data base approach, the problem of inconsistent data is automatically solved with the control of redundancy.

3. MANAGEMENT QUERIES

The database approach, in most of IS(Information System), pools the organization-wide files at one place known as CENTRAL DATABASE and thus is capable of answering queries of the management, relating to more than one functional area.

4. DATA INDEPENDENCE

- ✓ File management system-data dependent
  - Database approach – data independent
- ✓ The database approach provides independence between file structure and program structure.
- ✓ Such system provides an interface between the programs and the database and takes care of the storage, retrieval and update of data in the database.
- ✓ It allows applications to be written as general programs to operate on files whose structures can be made available to the program.
- ✓ **DBMS – generalized file processing system.**

5. ENFORCEMENT OF STANDARDS

- ✓ In the database approach, data being stored at one central place, standards can easily be enforced.
- ✓ This ensures standardized data formats to facilitate data transfers between systems.

2.3.5 Disadvantages of Data Base

1. Centralized database
2. More disk space
3. Operationally of the system
4. Security risk

1. CENTRALIZED DATABASE

- The data structure may become quite complex because of the centralized database supporting many applications in an organization.
- This may leads to difficulties in its management and may require a professional/ an experienced database designer and sometimes extensive training for users.

2. MORE DISK SPACE

Data base approach generally requires more processing than file management system and thus needs more disk space for program storage.

3. OPERATIONALITY OF THE SYSTEM

Since the database is used by many users in the organization, any failure in it, whether due to a system fault, database corruption etc, will affect the operationality of the system as it would render all users unable to access the database.

4. SECURITY RISK

Being a centralized database, it is more prone to security disasters.

2.3.6 Functions of DBMS

1. Data organization
2. Data integration
3. Physical/logical – level separation
4. Data control
5. Data protection

1. DATA ORGANIZATION

- DBMS organizes data items as per the specifications of the data definition language.
- Data base administrator decides about the data specifications that are most-suited to each application.

2. DATA INTEGRATION

- Data is inter-related together at the element level and can be manipulated in many combinations during execution of a particular application program.
- DBMS facilitates collection, combination and retrieval of the required data to the user.

3. PHYSICAL/LOGICAL – LEVEL SEPARATION

- It separates application programs and their associated data.
- DBMS separates the logical description and relationships of data from the way in which the data is physically stored.

4. DATA CONTROL

- DBMS receives requests for storing data from different programs.
- It controls how and where data is physically stored.
- Similarly it locates and returns requested data to the program.

5. DATA PROTECTION

- DBMS protects the data against access by unauthorized users, physical damage, operating system failure etc.
- DBMS is equipped with a facility to backup data and restore it automatically in the case of any system failure.
- Other security features include password protection and sophisticated encryption schemes.

2.4. DATA MODELS / DATA BASE STRUCTURES

✓ Several logical data models are used to build the conceptual structure.

✓ These data models describe the relationship among the many individual data elements stored in databases.

The various data models are,

1. Hierarchical model / tree model
2. Network model
3. Relational model
4. Object-oriented model
5. Multi-dimensional model

1. HIERARCHICAL MODEL

- ❖ In the hierarchical structure, the relationship between records are stored in the form of a hierarchy or a tree (inverted tree, with the root at the top and branches below)
- ❖ In this model, all records are dependent and arranged in a multi-level structure, thus the root may have a number of branches and each branch may have a number of sub-branches and soon.
- ❖ The lower most record is known as the '**child**' of the next higher level record, whereas the higher level record is called the '**parent'** of its child records.
- ❖ Thus in this approach, all the relationship among records are **one-to-many.**
- ❖ Early mainframe DBMS package used hierarchical model.
- ❖ A hierarchical approach is simple to understand and design but cannot represent data items that may simultaneously appear at two different levels of hierarchy

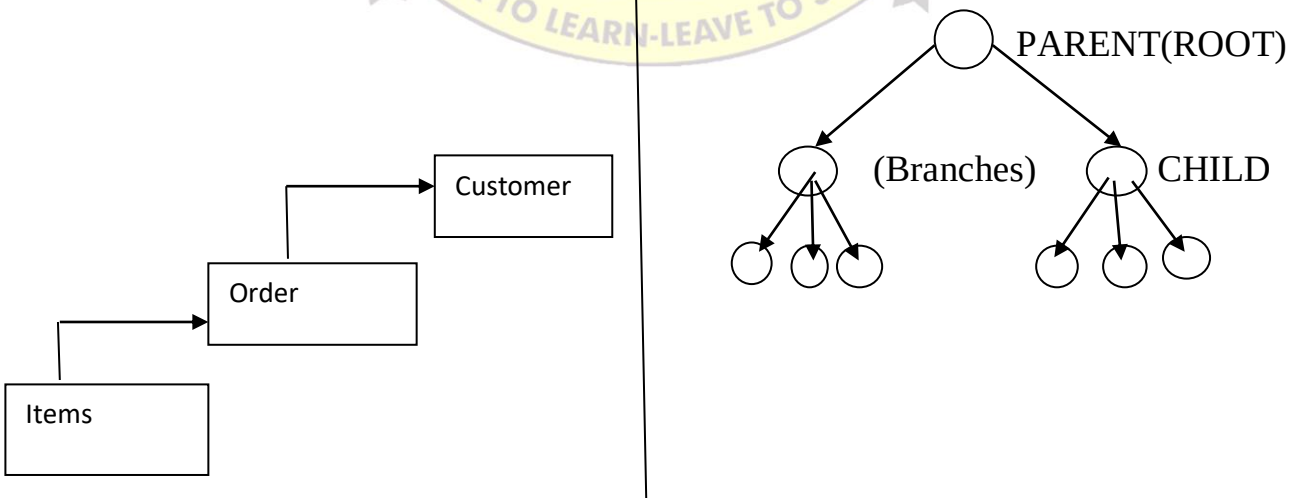
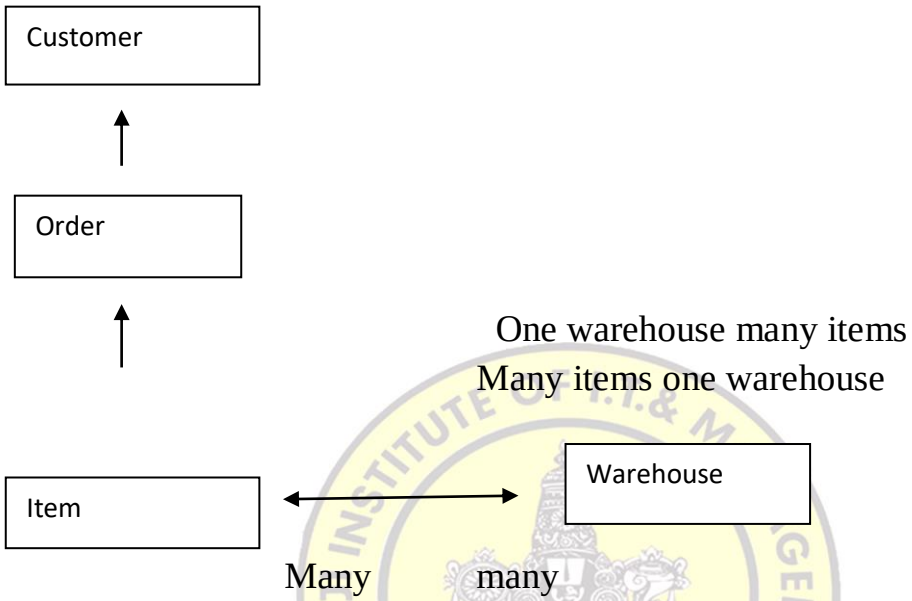


Fig: Hierarchial Data Model

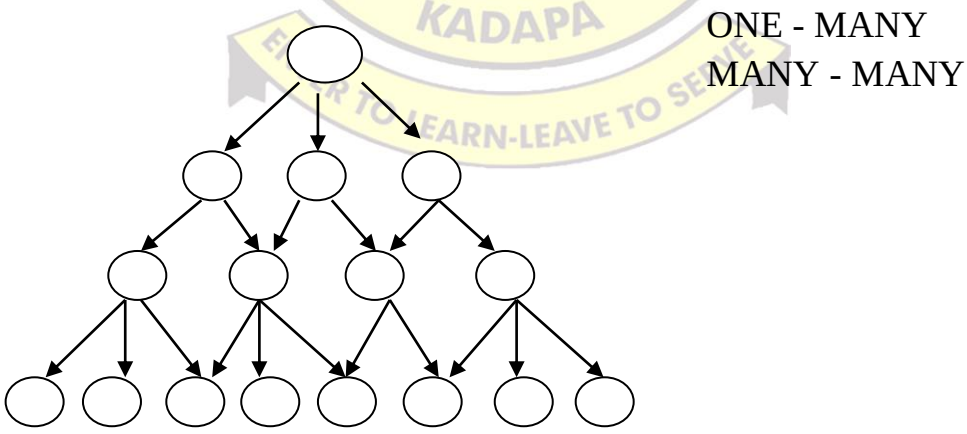
2. NETWORK MODEL

- The network model allows more complex 1:M(one to many) or M:M (many to many) logical relationships among entities.

- The relationships are stored in the form of linked list structure in which subordinate records, called **members**, can be linked to more than one **owner** (parent)
- This approach does not place any restrictions on the number of relationships.
- However, to design and implement, the network model is the most complicated one, and is used only in special type of applications.



a. The Entity Items Participate In More Than One Relationship



b. A Member Of A Network Database Can Have Multiple Owners.

FIG: Network Model

3. RELATIONAL DATA MODEL(Proposed by Dr E.F.Codd in 1970.)

- In a relational structure, data is organized in two-dimensional tables, called **Relations**, each of which is implemented as a **File.**

In relational model

- ROW – Tuple ,set of data item values relating to one entity
- COLUMN – Attribute ,set of values of one data item

employee — attributes (column titles heads)

Employee no	Name	Date of Birth	DESG	DEPT	salary
1	KIRAN	12/04/91	Finance manager	Finance	50.000
2	MANJULA	11/02/1985	Vice principle	Administration	30.000

Tuple → row values

Domain (a column value)

FIGURE: RELATIONAL DATA MODEL

DOMAIN

- A column consisting of a set of values of one data item is called domain
- A relation consisting of two-domains is called a relation of degree-2 (binary)
- Similarly degree-3 is called ternary and degree N as N-ary.

To avoid redundancy, the database is not designed only in one big table, generally called a flat file; rather it is designed as many related tables

C.NO	C TITLE	CREDITS	STD NO	T CODE
CS 101	MIS	6	25	07
CS201	SAD	4	25	15
CS304	Software engineering	4	25	30
CS406	IT	3	20	06

Table: data table course

a. Variety of data elements on each of a course offered by a business school

T-CODE	NAME	DEPT	DESIG	PHONE
07	Goyal	BM	Professor	9052694210
06	Sager	CS	Professor	7012351249
15	Sangeetha	BM	Professor	6214321510
30	Govind	CS	Professor	9440280570

Table: data table teacher

b. Data about the faculty of the school.

- Relational model – FLEXIBILITY AND EASY TO USE
- But in large-scale databases, because of many inter-related tables, the overall design may get complicated which may lead to slower searches and thus affecting the access time.
- However, such processing inefficiencies area continually being reduced through database design and programming.

4. OBJECT-ORIENTED MODEL

- ❖ Object-oriented model is an approach to data management that stores both data and the operations that can be performed upon the data as **OBJECTS**.
- ❖ While traditional DBMS are designed for **HOMOGENEOUS DATA**, object-oriented database area capable of manipulating **HETEROGENOUS DATA** that include drawings, images, photographs, voice and full-motion video.
- ❖ Object oriented database, stores the data and procedures as objects that can be automatically retrieved and shared.
- ❖ These days, object-oriented model is gaining popularity and many modern database systems support this model.

5. MULTI-DIMENSIONAL MODEL

- ❖ This model is an extension of the relational model.
- ❖ In this model, data is organized using multi-dimensional structure.
- ❖ Multi-dimensional structure can be visualized as cubes of data and cubes within cubes of data.
- ❖ Different sides of the cube are considered different dimensions of the data.
- ❖ This model enables a user to selectively extract and view data in one or more number of different dimensions, such as time, geographic region, product, organizational department, customer, or other factors.
- ❖ This model has become the most popular data model for the analytical databases that support OnLine Analytical Processing (OLAP) applications.

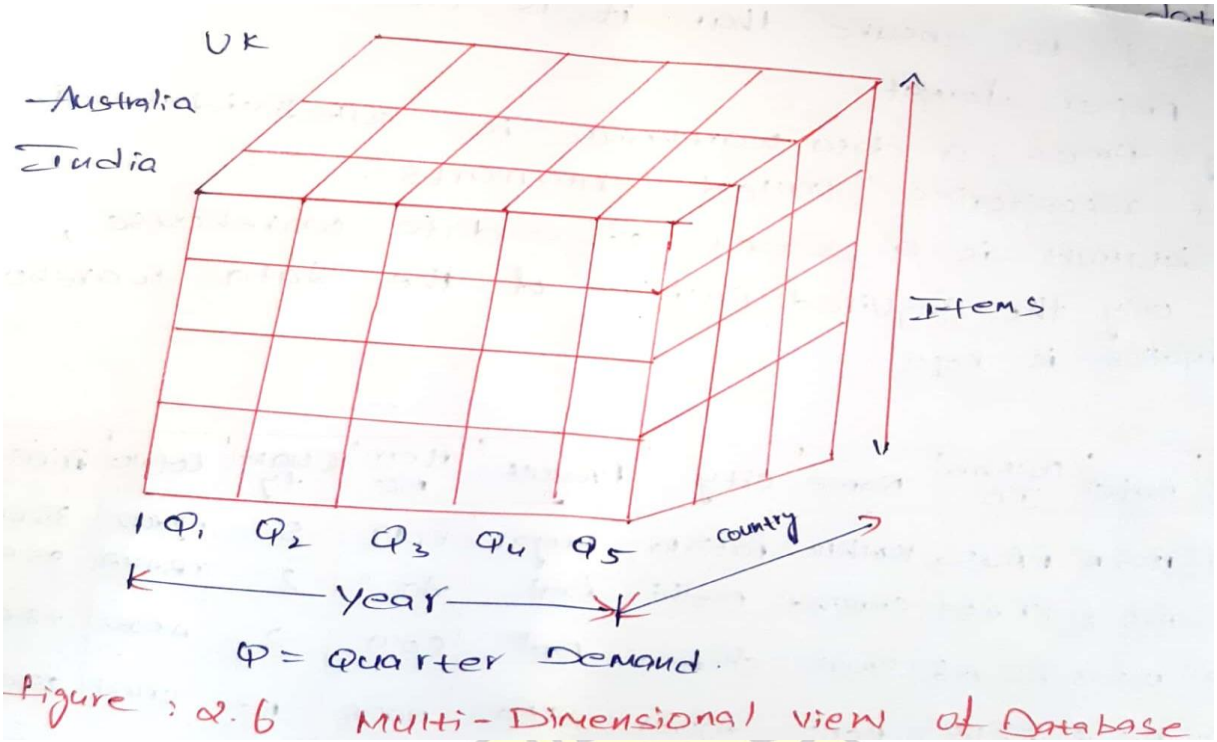


Figure : 2.6 Multi-Dimensional view of Database

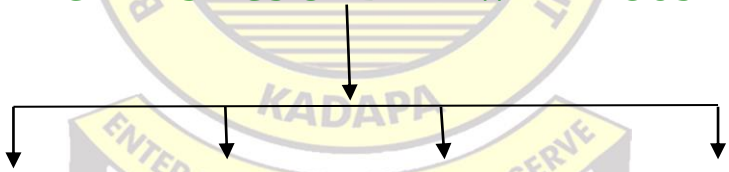
2.5 .DATA WAREHOUSING AND DATA MINING

2.5.1 DATA WAREHOUSE

- ✓ A data warehouse is a logical collection of information, gathered from many different databases.
- ✓ Thus data warehouse may be called as a **large database** containing historical transactions and other data.
- ✓ For example – if we take department store dealing in buying and selling grocery items.
- ✓ The data ware house would deal with granular data, information in its rawest form, within data ware house, each transaction may be recorded.
- ✓ The PURPOSE OF DATA WAREHOUSE is permanent storage of detailed information.
- ✓ Data entered into a data warehouse needs to be processed to ensure that it is clean, complete and in a proper format.
- ✓ Many a times, a data warehouse is subdivided in to smaller repositories called '**Data Marts.**'
- ✓ A data mart is a subset of a data warehouse, in which only the required portion of the data warehouse information is kept.

Key	Date	Customer ID	Name	City	Product	Item no	Quantity	Lot no	Price	source
1001	12.5.18	FA 456	Karthik	Patiala	Sugar	E 019	5	AXY002	35.00	RAJ TRADING
1002	12.5.18	KF 459	Govind	delhi	Dal	A 001	2	TBA047	98.50	SHIVAM
1003	12.5.18	FL 476	Swathi	Chennai	Dal	C 019	2	AB682	78.00	MITTAL & CO
1004	12.5.18	FA 457	Rani	Ajmer	Atta	B 008	10	SF431	25.00	RAJ TRADING
7340	12.5.18	C 241	Kumar	Banglore	Tea leaves	A 007	0.250	RT694	290	RAJ TRADING
6234	12.5.18	SF 356	Sandya	Sager	Rice	D 129	10	SC321	500	RAJ PADMA
1007	12.5.18	AZ 123	koushal	kolkata	salt	E 037	1	DO413	20	BALAJI TRADERS

IMPORTANT CHARACTERISTICS OF DATA WAREHOUSE



Subject-oriented integrated historical perspective non-volatile

1. **SUBJECT-ORIENTED**
   - It focuses on modeling and analysis of data relating to a specific area.
   - The data warehouse is organized around subject such as product, customer, sales etc.
2. **INTEGRATED**
   It is an integration of data from various different applications like ERP systems, CRM system etc.
3. **HISTORICAL PERSPECTIVE**
   The time variant for a data warehouse has a historical perspective in its approach, For example – past 5-10 years.
4. **NON-VOLATILE**
   It means data is stored permanently i.e. data once stored cannot be updated.

- Data warehouses are capable of storing vast quantities of data, but there is a challenge in implementing data warehousing applications.
- For successful implementation, organizations need to be very careful about the data quality.
- Missing and miscoded data has to be cleaned up, and variables often come in a variety of types, such as nominal data with no numeric content, dates, counts, averages etc.
- Thus, organizations must ensure the data quality in a data warehouse.

  To make data warehouses useful, organizations must use BI (business intelligence) tools to process data into meaningful information.
- These databases are used for data mining and online analytical processing (OLAP)
- The organizations that develop business intelligence (BI) tools create interfaces that help the managers to quickly grasp business situations.
- Such an interface is simple to understand and the interpretation by the managers becomes easy.
- Example – one such interface is called dash board ,because it looks similar to a car dash board visual images like speedometer – like indicators for periodic revenues, profits, and other financial information ;plus bar charts, line graphs, and other graphical representations are used in dashboards.

2.5.2 DATA MINING / KNOWLEDGE DISCOVERY IN DATA (KDD)

Definition

It is defined as a process used to extract usable data from a larger set of any raw data.

- It is the process of discovering or mining knowledge from a large amount of data.
- It attempts to extract hidden patterns and trends from large databases.
- It also support automatic exploration of data.
- Data mining queries are more advanced and sophisticated than those of traditional queries.

For example – a typical traditional query may be" what is the relationship between the amount of product A and the amount of product B that an organization sold over the past week?".

Where as in Data Mining, the manager would be interested to know the products that would be in demand on the coming weekend and thus the query from the data mining may be" find out the products most likely to have the maximum demand on the coming weekend."

The combination of data-warehousing techniques and data mining software makes it easier to predict future outcomes based on patterns discovered within historical data.

Objectives of Data Mining

1. **SEQUENCE / PATH ANALYSIS** - Finding patterns where one event leads to another.
2. **CLASSIFICATION** – finding whether certain facts fall into predefined groups.
3. **CLUSTERING** – finding groups of related facts not previously known and
4. **FORECASTING** – discovering patterns in data that can lead to reasonable predictions.

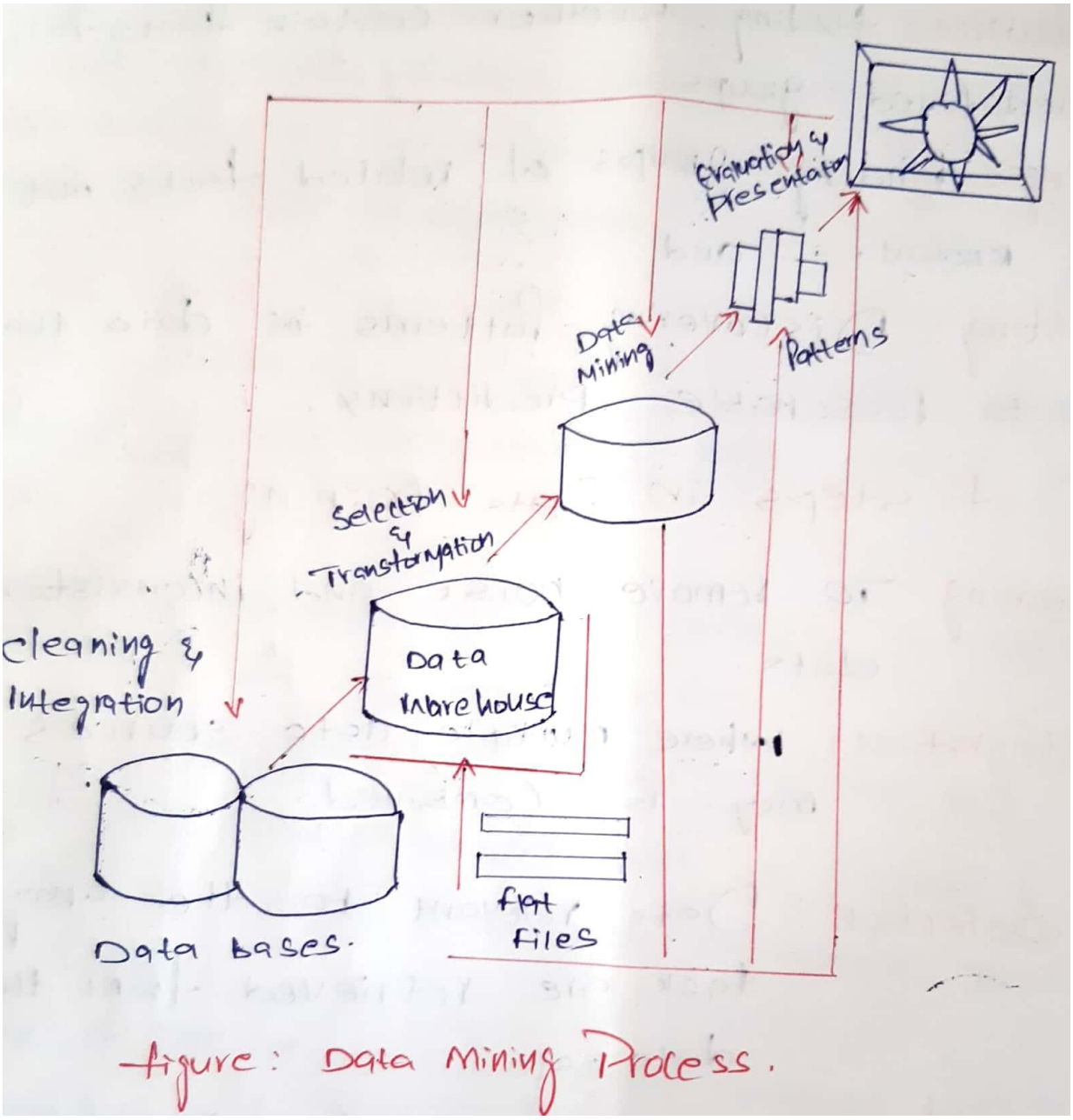


figure: Data Mining Process.

Sequence of Steps of Data Mining

1. **DATA CLEANING** – to remove noise and inconsistent data.
2. **DATA INTEGRATION** – where multiple data sources may be combined.
3. **DATA SELECTION** – data relevant to the analysis task are retrieved from the database.
4. **DATA TRANSFROMATION** – data area transformed into forms appropriate for mining by performing summary or aggregation operations.
5. **DATA MINING** – process where intelligent methods are applied in order to extract data patterns.
6. **PATTERN EVALUATION** – to identify the truly interesting patterns representing knowledge based on some interestingness measure. patterns are selected on interestingness basis.
7. **KNOWLEDGE PRESENTATION** – Visualization and knowledge presentation technique are used to present the mined knowledge to the user.

Applications of Data Mining

1. Retail or marketing
2. Banking
3. Insurance and health care
4. Transportation and
5. Medicine

UNIT-2

PREVIOUS YEAR QUESTIONS

1. (a)State the main characteristics of a database

(b)Distinguish between traditional and modern database management approaches**.(jan 2020 regular/supply) OR**

2. (a)What is data warehouse and discuss its merits and demerits.

(b)What are the business benefits of using intelligent techniques for knowledge management? **(jan 2020 regular/supply)**

3. (a)Define a database management system (DBMS) and describe how it works.

(b) Explain how DBMS benefits business organizations. **(October 2020 supply)**

OR

4. (a)What id data mining?What is the difference between data mining and data dredging?

(b) What is the goal of data mining? **(October 2020 supply)**

5. How DBMS is superior to conventional file processing system? List out salient features of DBMS. **OR**

6. Explain the term 'data mining'. Describe various data mining techniques.**(dec/Jan 2018/19 reg &supply)**

7. Explain the modern approaches of DBMS? **OR**

8. Briefly discuss the features of data warehousing**? (dec-2017-regular)**

Prepared By

L.Nikhila **B-Tech, MBA**

ASSISTANT PROFESSOR

BALAJI INSTITUTE OF IT & MANAGEMENT

Icet Code: BIMK

SUBJECT: MANAGEMENT INFORMATION SYSTEM (MIS)

Regulation: R17

DON'T LET THE NOISE OF OTHERS' OPINIONS DROWN OUT YOUR OWN INNER VOICE.

DIFFERENCE BETWEEN DATA HAREHOUSING AND DATA MINING

DATA WAREHOUSING	DATA MINING
• Data warehousing is the process of competing and organizing data into common database.	• Data mining is the process of extracting meaning full data from that database.
• Helps in identifying the certain data in a collection of data.	• Helps in figuring out a certain pattern of a data.
• Data is stored periodically.	• Data is analyzed regularly
• Stores a huge amount of data	• Analyses a sample of data.
• Provides a mechanism to store a huge amount of data	• Discover patterns in data for better decision making.

DIFFERENCE BETWEEN DATABASES AND DATA WAREHOUSES

DATA BASE	DATA WAREHOUSE
• Collection of files	• Collection of databases in a qualitative way.
• An organized collection of data.	• A central repository of integrated data from one or more sources.
• Primarily insert/write data.	• Primary read/retrieve data.
• Current/point-in-time data.	• Historical data.
• Online transactional processing	• Online analytical processing
• Provides a detailed relation all view.	• Provides a summarized multi-dimensional view.
• For many concurrent transactions.	• Not for a large amount of concurrent transactions.

DIFFERENCE BETWEEN TRADITIONAL APROACHES/FILE SYSTEM AND MODERN APPROACHES

TRADITIONAL APPROACHES/FILE SYSTEM	MODERN APPROACHES/DBMS
• Data redundancy/duplication.	• Controlled data redundancy.
• Data dependency	• Data independence
• Program dependency	• Program independence.
• No security	• Have security
• No access control	• Access control
• Lack of integration	• Integrated system
• It is for small system like C++	• It is used in large systems like oracle
• These are relatively cheap	• These are expensive
• They are very simple structure.	• Very complex structure.
• It requires very low design	• Designing is important
• Not secure	• Secure
• They are used for single user	• Multi-user
• Isolated data	• Shared data
• Very simple back up mechanism	• Backup complex.

If you can stay positive in a negative situation, You Win.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

Course Code	MANAGEMENT INFORMATION SYSTEMS	L	T	P	C
21E00106		4	0	0	4
	Semester	**I**			

Course Objectives:

- To provide the basic concepts of data and Management Information System and utility of the MIS for the managerial decisions.
- To Explain Management of Information system, MIS design and implementation process in an organisation.
- To discuss security, ethical and social issues in management of Information system.

Course Outcomes (CO): Student will be able to

- Know Management of Information system scope, application and challenges in managing MIS.
- Understand traditional and modern approaches for data resource management and models.
- Evaluate product based and process based cost and benefit to implement and maintain MIS in an organization.

UNIT - I	Lecture Hrs: 8

MIS An overview- Introduction, Need for MIS and IT nature and scope of MIS, MIS characteristics, Structure of MIS, role of MIS in global business. Challenges of Managing MIS.

UNIT - II	Lecture Hrs: 12

Data resource management- Data base concepts, The traditional approaches, the modern approaches (Data base management approaches) DBMS, Data models, Data ware housing and mining.

UNIT - III	Lecture Hrs:12

Business application of IS- Enterprise systems, ERP, CRM, SCM, DSS, Types of decisions, Decision support techniques, Decision making and Role of MIS, Business intelligence and Knowledge management systems.

UNIT - IV	Lecture Hrs:12

Management of IS- Project planning, SDLC, System development models, Project management, system analysis, system design, Implementation process, Product based MIS evaluation, Cost /Benefit based evaluation, Process based calculation, System maintenance

UNIT - V	Lecture Hrs:12

Security, Ethical &Social Issues : IS security threats, Protecting IS,IS Security Technologies, The disaster recovery plan, IS Ethical Issues, social issues.

Textbooks:

1. MIS –Managerial Perspective, D.P.Goyal,Vikas Publications.
2. Management Information Systems Text & Cases, W S Jawadekar, Tata McGraw-Hill.

Reference Books:

1. Management Information Systems, C Laudon and Jane P.Laudon, et al, Pearson Education.
2. MIS, Hossein Bidgoli, Nilanjan Chattopadhyay, Cengage Learning
3. Introduction to Information Systems, Rainer, Turban, Potter, WILEY-India.
4. Management Information Systems, James A. Obrein, Tata McGraw-Hill .
5. Cases in MIS, Mahapartra,PHI.
6. Management Information Systems, Gordon B. Davis & Margrethe H.Olson, Tata McGraw-Hill .

Online Learning Resources:

https://onlinecourses.nptel.ac.in/noc20_mg60/preview
https://nptel.ac.in/courses/110/105/110105148/
https://onlinecourses.swayam2.ac.in/cec21_ge05/preview

UNIT-3

BUSINESS APPLICATION OF IS (Information System)

INTRODUCTION

MIS Application in Business

MIS application in business falls into several different categories that provide information on all forms of functioning within an organization. Executives and departments within an organization could obtain any of the following forms of data:

- **Business Intelligence System:** In BI, all levels of management and executives can print data and graphs showing information or trends relating to growth, costs, strategic control, efficiency, risk and performance.
- **Executive Information System:** An EI system provides the same information as a BI system, but with greater attention to detail and more confidential information, designed to help top-level executives make choices that impact the entire organization.
- **Marketing Information System:** MI systems provide data about past marketing campaigns so that marketing executives can determine what works, what does not work and what they need to change in order to achieve the desired results.
- **Transaction Processing System:** TPS handles sales transactions and makes it possible for customers to sort search results by size, color or price. This system can also track trends related to sales and search results.
- **Customer Relationship Management System:** Keeping up with customers is key to overall success, and CRMS helps companies know when and how to follow up with customers in order to encourage an ongoing sales relationship with them.
- **Sales Force Automation System:** Gone are the days when sales teams must do everything manually. SFA systems automate much of what must be done for orders and to obtain customer information.

- **Human Resource Management System:** HRM systems track how much employees are paid, when and how they are performing. Companies can use this information to help improve performance or the bottom line.
- **Knowledge Management System:** Customers with questions want answers right away and knowledge management systems allow them to access frequently asked questions or troubleshoot on their own timetable.
- **Financial Accounting System:** Financial accounting systems help to track accounts receivable and accounts payable, in order to best manage the cash flow of a company.
- **Supply Chain Management System:** SCM systems record and manage the supply of finances, goods and data from the point of origin domestically or abroad, all the way to its destination in the hands of a customer.

Now-a-days IT (Information Technology) is being used to develop **integrated cross-functional enterprise information systems** that cut across the traditional functional areas of a business organization with an objective to re-engineer and improve the business processes all across the organization.

These cross-functional enterprise information systems are seen as a strategic way to use IT to share information resources and improve the efficiency and effectiveness of business processes and develop long-term relationship with the customers, suppliers and other business partners. Many organizations are structured based on functional areas.

3.1. ENTERPRISE SYSTEM:

DEFINITION: The overall combination of computer hardware and software that a business uses to organize and run its operations.

For example- An integrated enterprise system will generally handle more than one operation for a company to facilitate its business and management reporting needs.

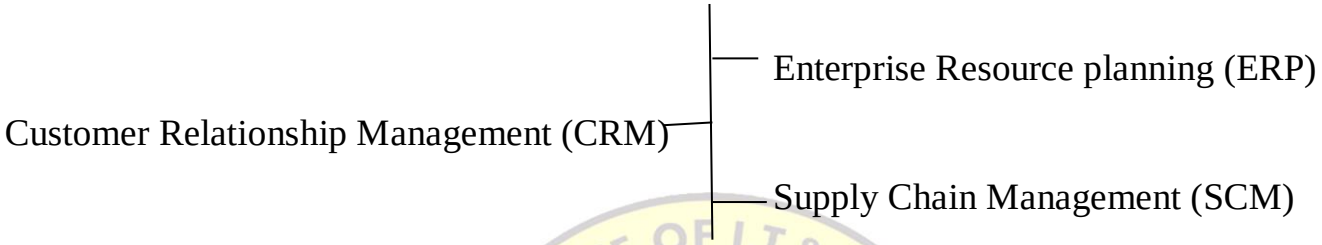
- Enterprise systems are highly integrated information systems that cut across the traditional areas in an organization and thus the scope of such systems is entire enterprise wide.
- Such systems even go beyond the boundaries of the organization and may have interfaces with the other stake holders of the business like dealers, customers etc.

- Now-a-days, instead of having functional mainframe based legacy systems, organizations are shifting to integrated cross functional client / server applications.

For example – ERP (Enterprise Resource Planning), SCM (Supply Chain Management) systems, and CRM (Customer Relationship Management) systems.

These organizational wide IS act as the backbone for the entire organization.

Types of Enterprise Information System



3.2 .ENTERPRISE RESOURCE PLANNING (ERP) SYSTEM

- ERP term is derived from the Material Resource Planning (MRP)
- Aim of ERP is to integrate all the data and processes into single system.
- To perform the integrations,(all data processes in to single system) ERP system uses the multiple software and hardware components.
- ERP system uses various techniques and concepts to increase the use of organizational resources in order to improve the working process of entire organization.
- According to JAMES O'BRIEN, ERP is the technological backbone of E-business (which includes sales order processing ,inventory management and control, production and distribution ,planning and finance)

3.2.1 ERP DIFINITION

ERP is an enterprise wide information system that integrates and controls all the business process

Or

ERP is software that facilities the flow of information among the different functions within an enterprise.

- With the help of ERP all the departments in an enterprise are able to share information and communicate with each other more efficiently due to the fact that ERP combines all the business processes into an integrated and united software program.
- ERP uses **a single database** to maintain the data
- The main concept of ERP system is to replace the old standalone computer systems of individual departments (having separate software that manages departmental functions related to manufacturing, finance, HR etc show in figure.
- So employees from various departments such as purchasing, finance and manufacturing are able to carry out functions related to their own area using the software and can also used the enterprise wide information and improve the quality of decisions.

For example: a finance manager can use the ERP system to know the status of the shipment of the sales orders (from ware house) to plan a working capital management for upcoming time

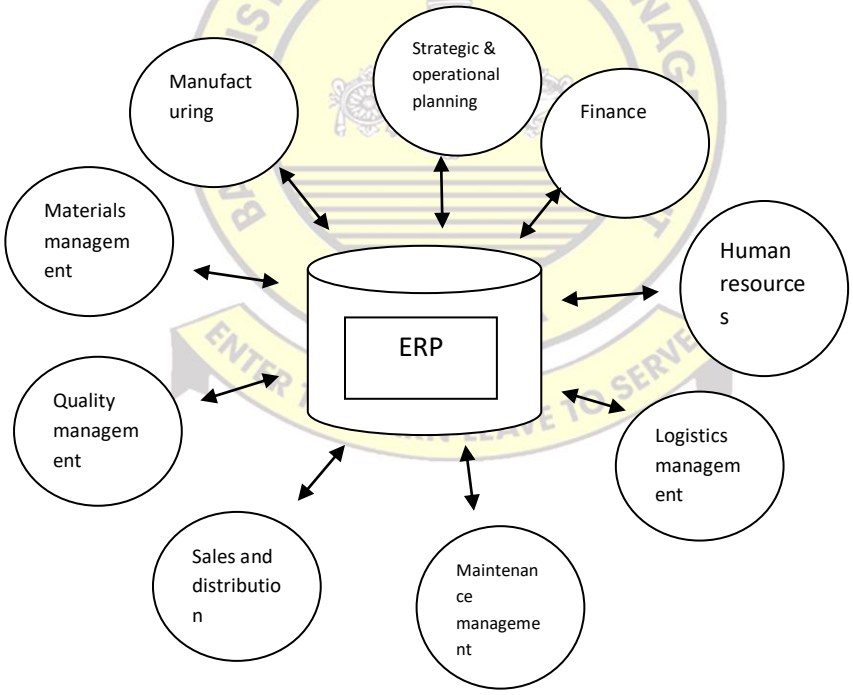
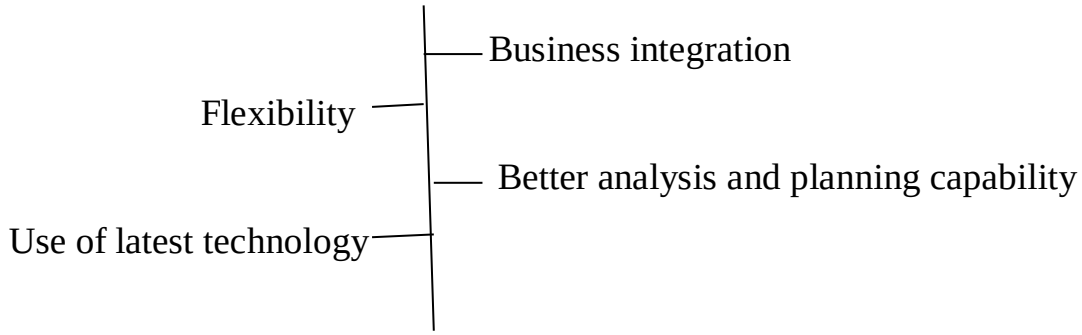


Figure: ERP System

3.2.2 NEED OF ERP SYSTEMS



1. BUSINESS INTEGRATION :

ERP systems integrate the business processes because it updates data automatically and also exchange information among various applications and related components of business.

In case of ERP whenever any transaction occurs, the data related to particular business function is automatically updated thus using ERP a person becomes capable to take the business details in real time and carryout timely management of decisions based on the information.

2. FLEXIBILITY: ERP is flexible in nature.

- It is possible to manage various locations of a company as the system supports various languages accounting standards and currencies.
- The advantage of flexibility are not only associated for maintenance and development but also for the management.

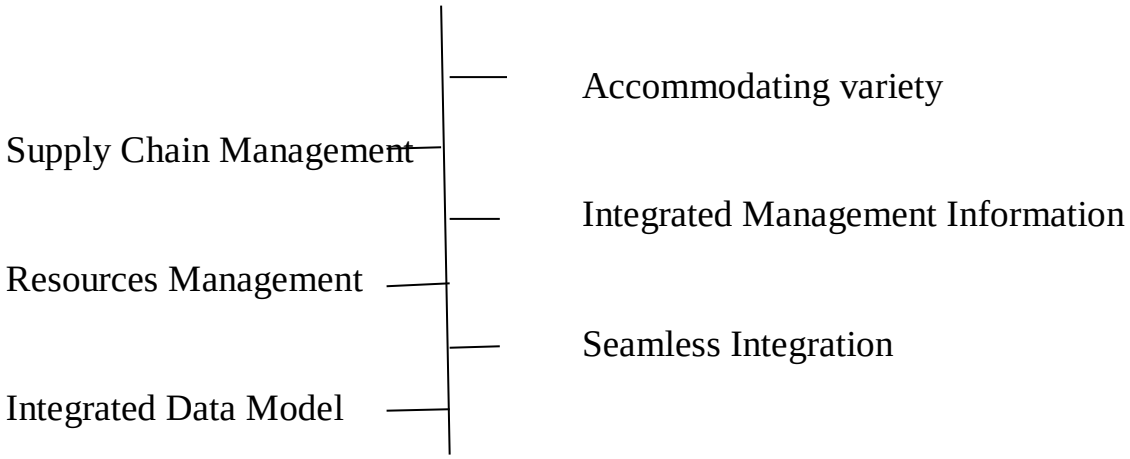
3. BETTER ANALYSIS AND PLANNING CAPABILITIES

- The system enables the user to input and analyze the data from various sources in the real time and in flexible manner
- This enables the decision makers to get the required information and take efficient high quality decisions

4. USE OF LATEST TECHNOLOGY :

- ERP follows latest technology development (Such as client server technology, e-commerce, internet, intranet etc.,) that are being introduced in the field of IT .
- The future changes in the business environment can be easily accommodated as the systems are able to quickly adopt themselves to the latest changes in the field of IT.

3.2.3 CHARACTERISTICS /FEATURES OF ERP:



1. ACCOMMODATING VARIETY :

The ERP software has the ability to support multiple currencies as well as languages. The business is also able to succeed globally as ERP software supports multi-facility and multi - mode manufacturing.

2. SUPPLY CHAIN MANAGEMENT :

With the help of the (IRP) Intelligent Resource Planning, it is possible to optimize the flow of demand and supply data. The demand supply chain can thus be optimally identified by building relationship between various activities.

3. INTEGRATED MANAGEMENT INFORMATION:

The present business managers are using ERP for the following reasons,

a. There is no need to depend on the IS department as the ERP serves as a flexible reporting tool for extracting information when required.

b. ERP supports EDI (Electronic Data Interchange). Thus, information regarding the customer, purchase order, cash payments can be received electronically.

It is also possible to send invoices and acknowledgements to the customers with the help of EDI.

c. ERP stores original purchase orders, contracts, sales orders etc.

4. RESOURCE MANAGEMENT

- ✓ ERP effectively manages the
- ✓ A.HUMAN RESOURCE (taking care of training needs, carrier, performance review, applicant tracking, job descriptions and evaluations, cost benefits etc.)

- ✓ B.EQUUIPMENT OF AN ENTERPRISE (It maintains online record regarding the status and location of the equipment, operating cost, maintenance).

5. SEAMLESS INTEGRATION

Introduction of new products and changes in the existing products. (Engineering change management)

6. INTEGRATED DATA MODEL

- The creation of an integrated data model is the heart of any ERP system.
- It is able to integrate the data associated with the entire enterprise system and provide data to customers, suppliers and employees.

3.2.5 PHASES OF ERP IMPLEMENTATION:

The installation of hardware and software is mainly related with the ERP implementation.

IMPLEMENTATION:

A well-defined project which ranges from the choice of the systems through the configuration and the training till it is implemented in actual usages and becoming operative is termed as implementation.

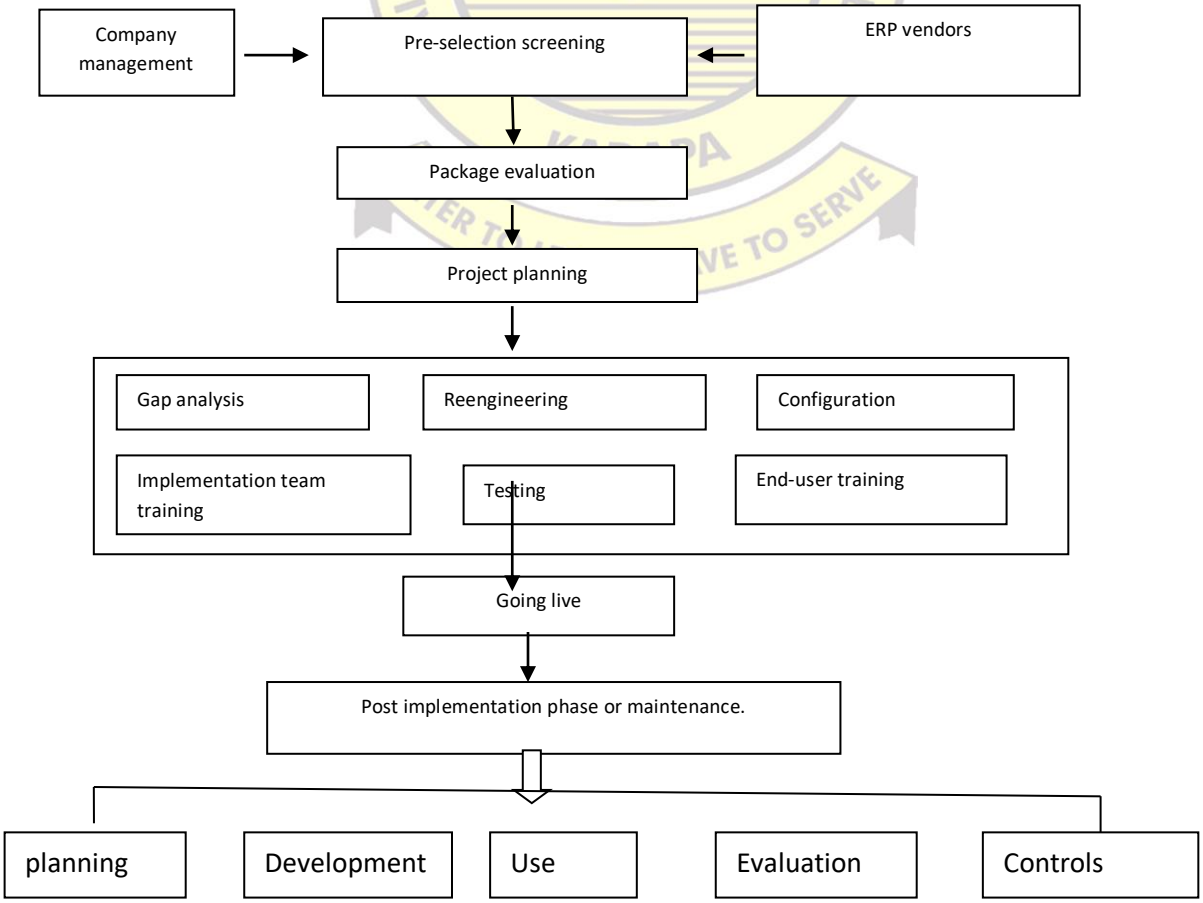


FIGURE: ERP Implementation Life Cycle-Different Phases

3.2.6 ADVANTAGES OF ERP

1. Reduction of lead time
2. On-Time shipment
3. Reduction in cycle time
4. Improved Resource utilization
5. Better Customer Satisfaction
6. Improved supplier performance
7. Increased flexibility
8. Decision-making capability

3.7 DIS-ADVANTAGES

1. Expense and Time in implementation
2. Difficulty implementing change
3. Difficulty integrating with other systems (e-commerce financial analyses programs)
4. Risks in using one vendor (to switch another vendor , ERP system involves high cost)
5. Risks of implementation failure (as it requires the use of best IS and business people, huge amount of resources)

3.2.4 ELEMENTS OF ERP

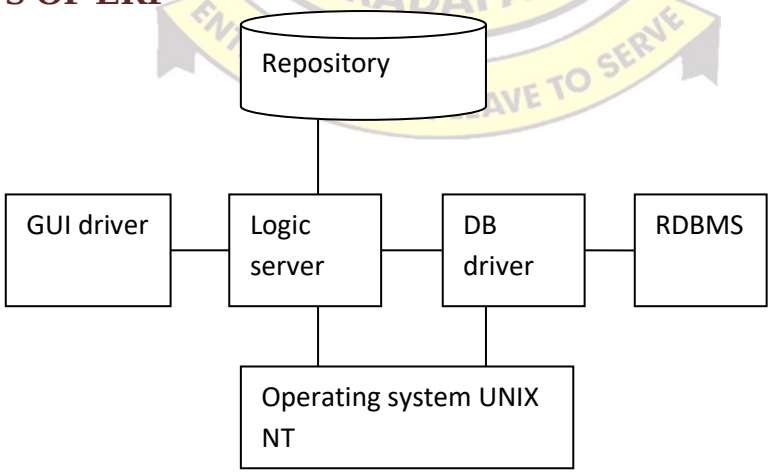


FIG: ELEMENTS IN ERP ARCHITECTURE

1. GRAPHICAL USER INTERFACE (GUI)

- The manufactures follow certain style guidelines while designing the GUI.
- GUI determines the interface model and design of menus, system messages, windows and operating elements.

Some of The Popular Style Guides are Shown Below,

A. CUA-Common User Access (IBM)

B. Human Interface Guidelines (apple)

C. OSF/motif style guide

D. Windows interface (Microsoft)

2. RDBMS (RELATIONAL DATABASE MANAGEMENT SYSTEM)

- ✓ It IS invented by EDGAR F.CODD in 1970.
- ✓ RDBMS-is subset of DBMS.
- ✓ A relational database refers to database that stores data in a structured format using rows and columns.
- ✓ It is relational because the values within each table are related to each other.

3. REPOSITORY

The entire set of data of an enterprise is stored in the repository environment. These can be accessible globally.

4. OPERATING SYSTEM

- ✓ An OS is system software that manages computer hardware and software resources and provides common services for computer programs.
- ✓ Thus OS acts as manager of all the resources.
- ✓ Example: **UNIX:** UNIX is a family of multitasking, multiuser computer OS(Operating System).
- ✓ WINDOWS NT: It is a family of OS produced by Microsoft.

3.3 CUSTOMER RELATIONSHIP MANAGEMENT (CRM) SYSTEM:

3.3.1 DEFINITION OF CRM SYSTEM: It is defined as a set of software applications that help an organization to determine the needs and preferences of their customers by managing, organizing, tracking and storing all customers' interactions.

- ➢ CRM is a strategy for a business to manage its interactions with its customers.
- ➢ In order to achieve customer satisfaction objective, they try to focus on the customers and to build a long-term relationship with them.

➢ It is an established fact that besides acquiring new customers, retaining of the existing customers are much more important for the companies.

3.3.2 INTERACTIVE CYCLE OF CRM:

The interactive cycle of CRM is shown in figure

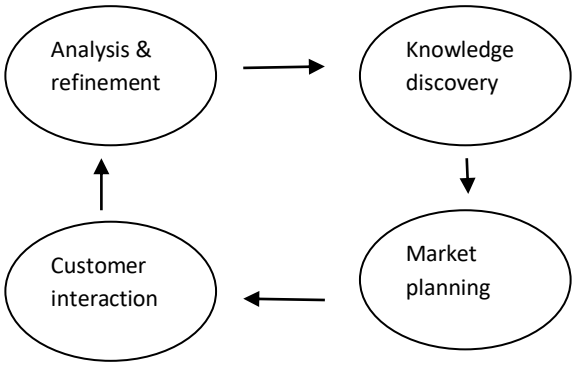


FIG: THE PROCESS CYCLE OF CRM

The CRM helps an organization in the following,

1. Restoring the personal-service concept
2. Maximizing lifetime value of each customer
3. Enabling immediate action to retain the most valuable customers.
4. Identifying high-risk customers and adjusting service accordingly.
5. Enabling the organizations to fulfill customer needs at the right time with right offer.
6. Increasing the rate of return on marketing initiatives.

3.3.3 CRM SYSTEM:

- ❖ CRM applications generally are available in the form of packaged software developed by various vendors like Oracle, People Soft, SAP etc.
- ❖ CRM system consolidates all the information and provides a unified view of a customer across the organization.
- ❖ CRM is an approach which combines people, process and technology that allows the organizations to understanding their customer and retain the most profitable ones.

Business process

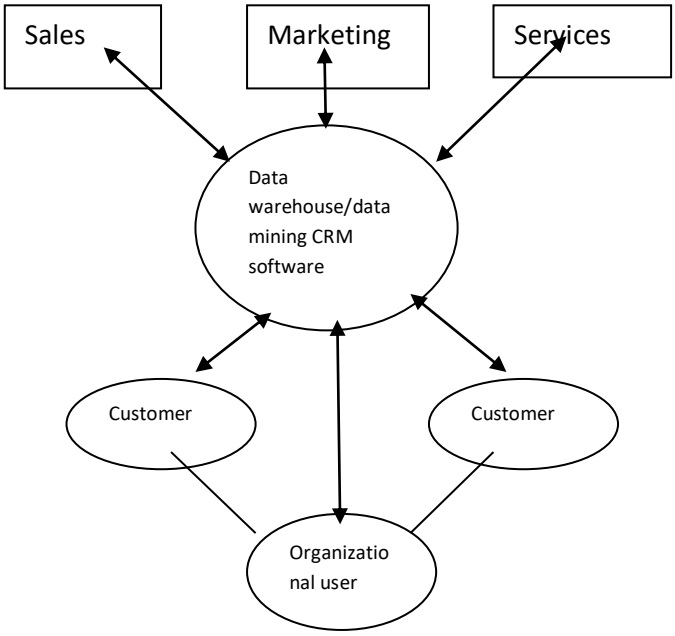


FIG: THE CONCEPT OF A CRM SYSTEM

Figure depicts a conceptual model of a typical.

3.3.4 COMPONENTS OF CRM SYSTEM

- Customer interface
- Sales
- Marketing
- Customer service & support
- Data mining, marketing software, Data Warehouse, CRM Data Marts

1. **CUSTOMER INTERFACE**

- ✓ This component of CRM system assists sales, marketing and service employees in capturing and tracking all data about the existing customer.
- ✓ Such information is captured from the customer touch points such as telephone, emails, fax and company's website (internet), retail stores and any personal contact.
- ✓ CRM system stores all the captured data in a common customer data base that integrates all customer account information and makes it available throughout the organization through internet for sales, marketing and service CRM applications.

2. **SALES**

   CRM system provides the software tools and information to all sales people, which is required to support and manage the sales activities.

3. **MARKETING**

   The CRM system helps marketing professionals capture and manage customer response data in the CRM database and analyze the customer and business value of a company's marketing campaigns.

4. **CUSTOMER SERVICE AND SUPPORT(CSS)**

   CSS is the part of a company's CRM department that interacts with a customer for their immediate benefit, including components. Such as the contact center, the helpdesk and the call management system.

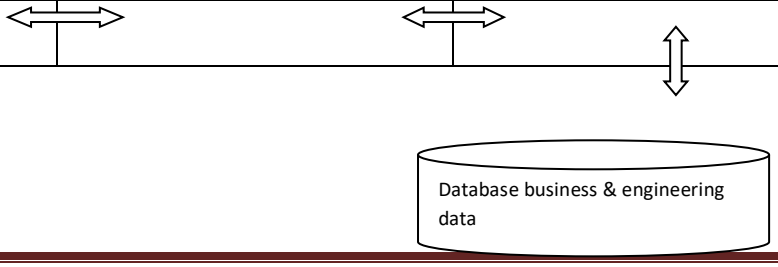
5. **CRM MODEL BASE**

   It includes analytical tools like data mining tools and other analytical marketing software, and CRM database consists of a customer data warehouse and CRM data marts.

3.3.5 ARCHITECTURE OF CRM SYSTEM

- ✓ CRM systems include data warehouse as its technology support and intelligent data mining tools.
- ✓ In order to generate the hidden patterns and to make the predictions, data mining tools are applied on the data warehouse maintained by an organization.
- ✓ Major components of CRM systems may be understood as discussed as in figure.

Communication CRM (front-end)	Operation CRM (core-centre)	Analytics CRM (back-end)
Call centre	Marketing	Information search
e-commerce	Sales	Analysis
Web	Services	Algorithm
Wireless		



3.3.6 OBJECTIVES OF CRM

1. Customer satisfaction
2. Run an efficient business
3. Gaining new customers

3.3.7 ADVANTAGES

1. Provide better customer service
2. Discover new customers
3. Make call centers more efficient
4. Simplify marketing and sales processes
5. Create detailed profile
6. Better communication channels
7. Reduction of sale cycle and increase of sales

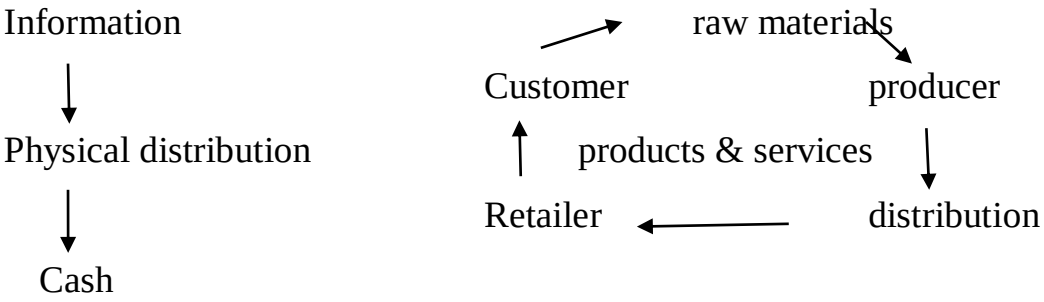
3.3.8 DIS-ADVANTAGES

1. Training cost increase
2. Overhead costs
3. High cost
4. Difficult to integrate with other MIS
5. Small companies – not possible
6. Requires continuous maintenance, updating of information

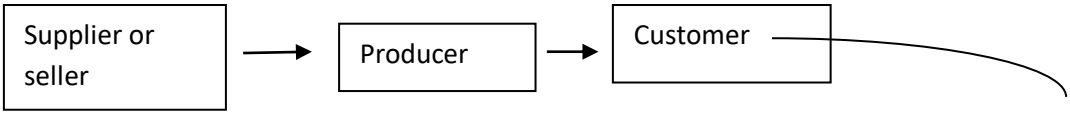
3.4. SUPPLY CHAIN MANAGEMENT (SCM) SYSTEM:

3.4.1 SUPPLY CHAIN:

A supply chain is a global network used to deliver products and services from raw materials to end customers through information physical distribution and cash.



BASIC SUPPLY CHAIN OF A PRODUCT



- Energy
- Raw Materials Components from sellers

Receives the finished products

- Services Furnished Goods
- Components services

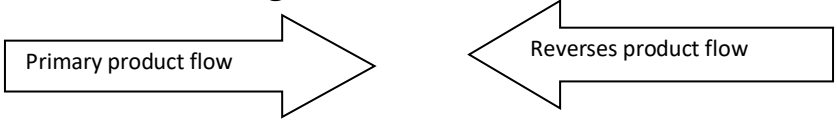
EXAMPLE –Plastic → crockery → uses crockery

Electronic wire → power → turns on lights

Fabric → shirts → wear shirts

FLOWS IN SUPPLY CHAIN

- Invoices payments of products
- Sales literature supplies
- Specifications
- Receipts
- Orders
- Rules and regulations



- Material returns for repair
- Components replacements
- Supplies recycling

- Services disposals
- Finished products

SUPPLY CHAIN EXAMPLE

1. **BAKERY** Flour, Cream, Sugar } cakes customers

Farmer

Wheat ——flour —whole seller's —— stores

Field

Primary product flow primary cash flow

3.4.2 SUPPY CHAIN MANAGEMENT (SCM)

In simple terms SCM is managing the supply chain.

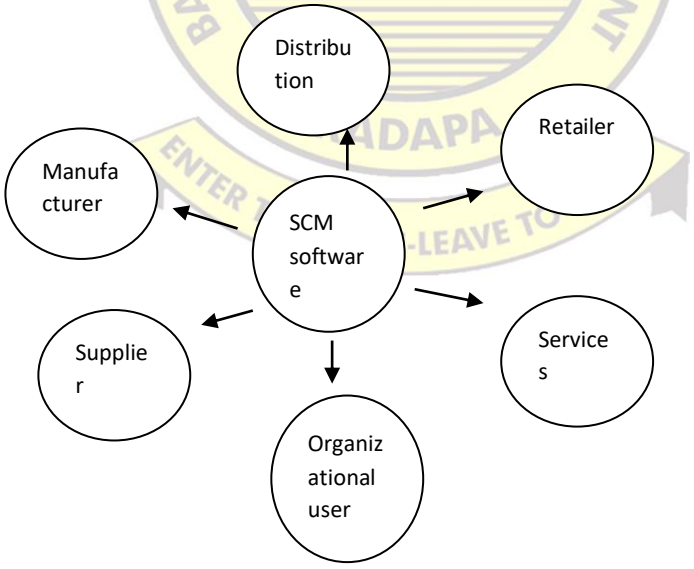


Figure portrays the concept of supply chain

FIG: THE CONCEPT OF SUPPLY CHAIN MANAGEMENT SYSTEM

3.4.3 SCMS (Supply Chain Management System):

SCMS makes supply chain management more efficient by helping companies to coordinate, schedule and control procurement, production, inventory management and delivery of products and services.

The basic components of SCMS are shown in figure.

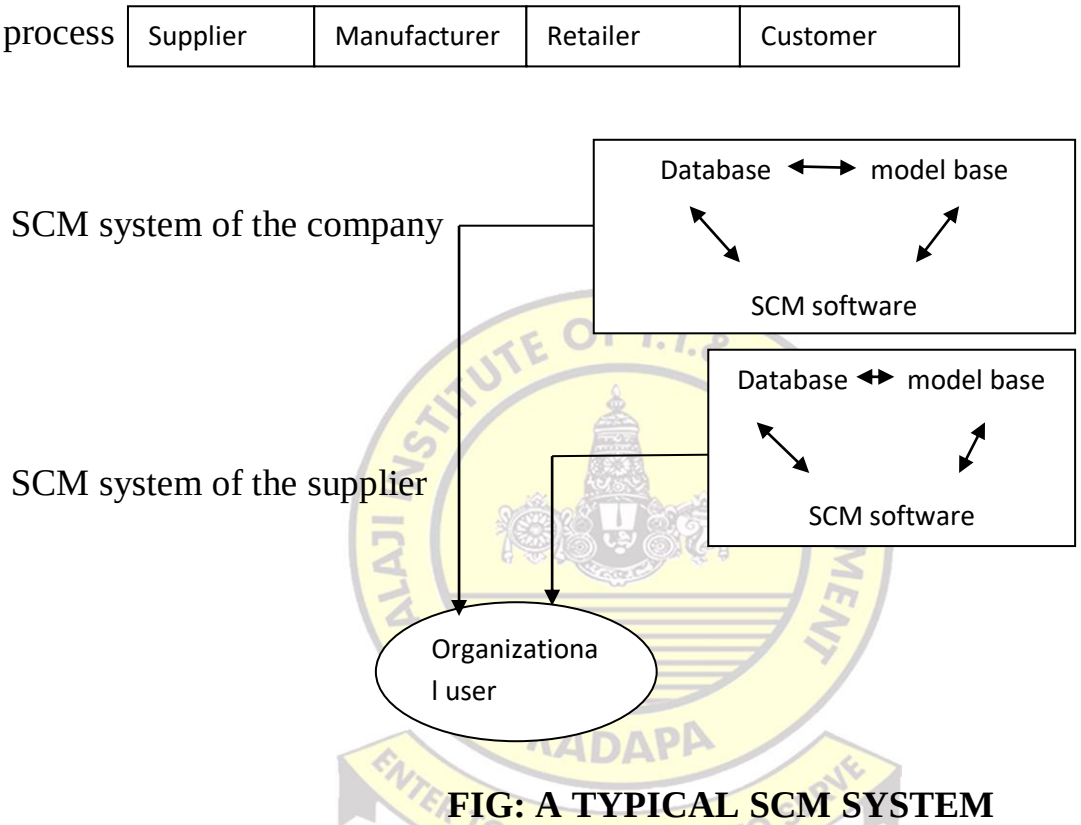


FIG: A TYPICAL SCM SYSTEM

3.4.4 BENEFITS OF SCM

1. The organization would be able to decide when and what to produce, store and move.
2. Orders can be communicated quickly.
3. Organizations can track the status of orders.
4. Shipments can be tracked.
5. Inventory, transportation and warehousing cost can be reduced.
6. Production can be planned based on the actual plan.
7. Any changes in the product design can be communicated quickly.

3.4.5 DIS-ADVANTAGES

- There may be staff resistance
- Fore cast fails
- Not flexible
- Demands IT to ~~run~~
- Sometimes very expensive to implement
- Competitors can easily copy the strategy Of SCM

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SUBJECT: MANAGEMENT INFORMATION SYSTEM (MIS)

Regulation: R17

Success is not the key to happiness. Happiness is the key to success. If you love what you are doing, you will be successful.

EXPECTED QUESTIONS – MIS (17E00106)

UNIT-1

1. **Define MIS? What is MIS and overview of MIS? What are the different types of management? What are the functions, Components and benefits of MIS?**
2. **What is the need for MIS and Explain IT nature and scope of MIS?**
3. **What are the characteristics and structure of MIS?**

UNIT-2

1. Explain the Modern approaches of DBMS?

2. What are the different types of Data Models?

3. Discuss the features of data warehousing and data Mining and Differentiate them.

UNIT-3

1. **Explain the Concepts and Characteristics of DSS? What are the types of decisions? What are decision support techniques?**
2. **What is decision making and role of MIS.**
3. **Write a note on a)Business Intelligence**

b)Knowledge Management System

UNIT-4

1. Explain Project Planning.

2. Write about SDLC and System Development Models.

3. What is Evaluation? Explain Product based Evaluation, Process based evaluation and cost/Benefit based evaluation.

4. Briefly explain System Maintenance.

UNIT-5

1. Discuss about IS security threats and IS security technologies.

2. How do you protect IS.

3. Explain the disaster recovery plan.

UNIT-3

BUSINESS APPLICATION OF IS (INFORMATION SYSTEM)

3.5 DECISION SUPPORT SYSTEM (DSS)

INTRODUCTION

- While understanding management as a component of MIS we have advocated that decision-making is the essence of management.
- In order words, whatever a manager does in an organization, he/she does it through decision-making.
- That is why decision making is regarded as the core of managerial functions.
- Decision-making is no longer based on the creativity, judgment, intuition, experience of a manager.
- Rather Today's manager has to operate order ever increasing complexities of business as well as that of management.
- It is more difficult to make decisions for several reasons.

For example,

1. The number of available alternatives is much larger than ever before because of improved technology and communication systems.
2. The environment today is more dynamic and finally the ever increasing competition, forces the managers to act fast and take quick decisions

The important factors and their effect on the decision-making area listed in table

Factors	Effect
More complexity in IT	More alternatives
More changes, fluctuations	Need for quick decisions
Increased organizational complexity	High cost of wrong decisions

Table: Factors Affecting Decision Making

In order to cope with such a situation, today's manger must understand the decision making process ,decision situations, application of new tools and techniques and the applications of computerized support systems in their decision-making.

3.5.1 DECISION-MAKING: A CONCEPT

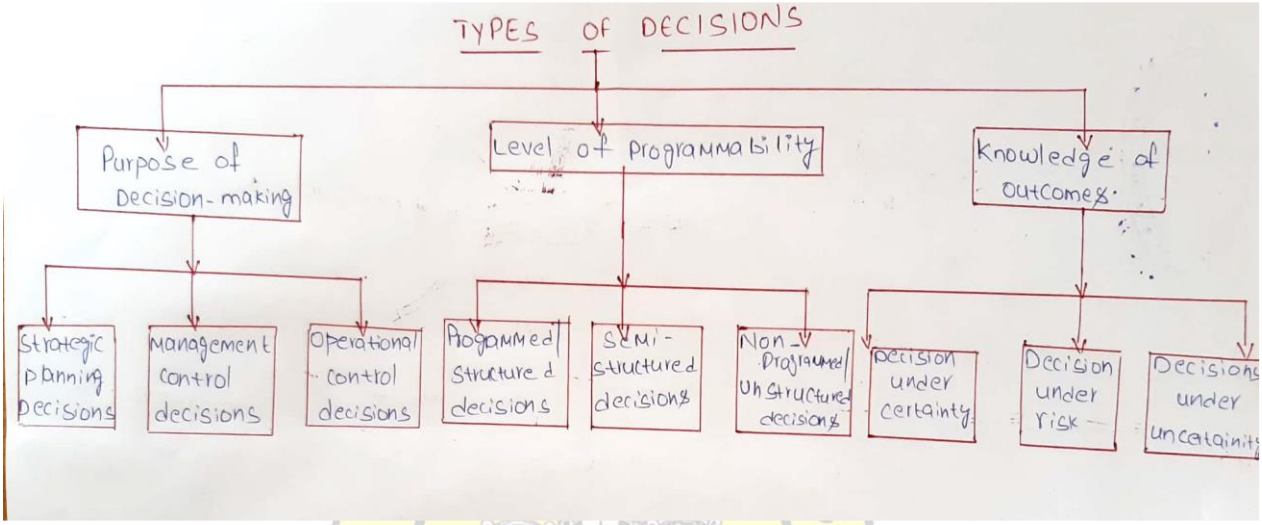
- ✓ Decision making has been taken from the word decide which is a Latin word meeting **to come to a conclusion.**
- ✓ Decision may be regarded as a choice whereby a decision-maker comes to a conclusion about the given situation.
- ✓ Decision-making on the other hand, is a process of selecting one optimum alternative from among alternatives of a course of action.
- ✓ Thus, a decision is an end of the final product of the decision-making process.
- ✓ In organizations some of the decisions can be made easily with a minimum of mental effort but in most cases, decision-making becomes a complex issue.
- ✓ Decision-making involves the entire process of ,
  1. Establishing goals
  2. Defining activities
  3. Searching for alternatives and
  4. Developing plans.

Decision-making includes all the activities of

1. Coordinating
2. Information processing
3. Problem solving and
4. Evaluating that usually precede a decision.

3.6. TYPES OF DECISIONS

- Organizational decisions differ in a number of ways these differences affect the development of alternatives and the choice among them. They also affect the design of IS support for decision activities.
- The following bases are important to classify decisions.



1. PURPOSE OF DECISION-MAKING

A. STRATEGIC PLANNING DECISIONS (top level managers)

- ✓ Strategic Planning Decisions are those decisions in which the decision-maker develops objectives and allocates resources to achieve these objectives.
- ✓ Decisions in this category are of long-time period and usually involve a large investment and effort.
- ✓ Such decisions are taken by SPL (top level) managers.

  Example – introduction of new product, Acquisition of another firm etc.

B. MANAGEMENT CONTROL DECISIONS (middle level)

- ✓ Management Control Decisions are taken by management control level mangers and deal with the use of resources in the organization.
  - **Example** – analysis of variance, product mix planning decisions.

C. OPERATIONAL CONTROL DECISIONS (bottom level)

- ✓ It deals with the day-to-day problems that affect the operation of the organization.
    - **Example** – production scheduling decisions and inventory control decisions like the product to be produced for the day ad their quality to be ordered one OCD.
- ✓ Such types of decisions are normally taken by mangers at the operational (bottom level) of the management hierarchy in the organization.

2. LEVEL OF PROGRAMMABILITY

A. PROGRAMMED/STRUCTURED DECISIONS (low level handle)

- ✓ Programmed/structured decisions are those decisions, which are well defined and some specified procedure or some decision rule may be applied to reach a decision.
- ✓ Such decisions are routine and repetitive and require little time for developing alternatives in the design phase.
- ✓ More modern techniques for making such decisions involve operations research (OR), mathematic analysis, modeling and simulation etc.
- ✓ Decisions of this kind can be delegated to lower levels in an organization. **For example**-inventory reorder decisions fall under this category.

B. SEMI-STRUCTURED DECISIONS

- ✓ Many decisions situations in the real world are either unstructured or unstructured ones.
- ✓ However decision situations which do not fall within any of these two extremes are known as semi-structured decisions.

C. NON-PROGRAMMED/UNSTRUCTURED DECISIONS (top level handle)

- ✓ Decisions which area not well-defined and have no pre-specified procedure or decision rule are known as non-programmed decisions.

- ✓ For these decisions, sufficient time has to be spent in the design phase.
- ✓ Unstructured decisions tend to be solved through judgement, rule of thumb etc.
- ✓ Modern approaches to such decisions included special data analysis on computers.
- ✓ Decisions of this kind are usually handled by strategic planning level managers.

  For example – introduction of a new product, planning for R & D (Research and Development).

Class	Operational control	Management control	Strategic planning
Structured	Order processing	Budget analysis	Warehouse location
	Accounts receivable		
Semi-structured	Inventory control	Analysis of variance	Introduction of new product
	Production scheduling new product		
Un structured	Cash management	Budget formulation	R & D planning
	Long term forecast		

TABLE: DIFFERENT CLASSES OF DECISIONS

3. KNOWLEDGE OF OUTCOMES

- ❖ An outcome defines what will happen, if a decision is made or course of action taken.
- ❖ When there is more than one alternative, the knowledge of outcome becomes important.

A. DECISION UNDER CERTAINITY

- ✓ Decision-making under certainty takes place when the outcome of each alternative is fully known.
- ✓ There is only one outcome for each alternative.
- ✓ In such cases, the decision-maker is required to compute the optimal outcome.

B. DECISION UNDER RISK

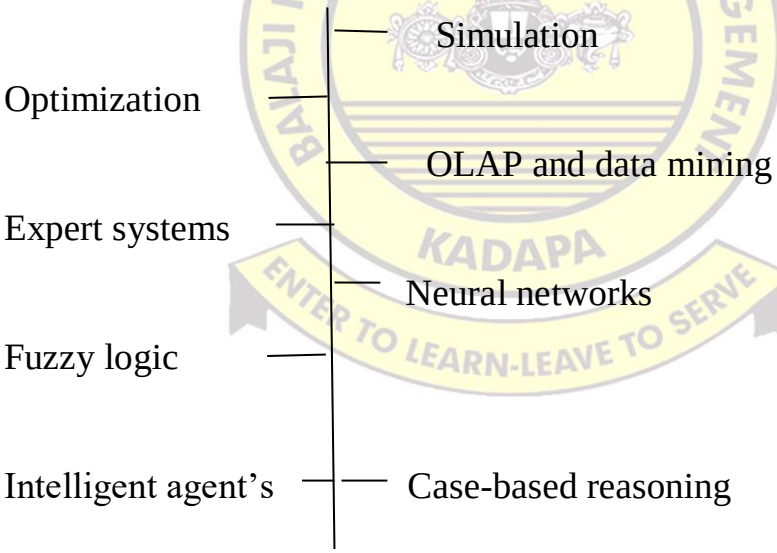
- ✓ It occurs when there is possibility of multiple outcomes of each alternatives and a probability of occurrence can be attached to each outcome.
- ✓ Here, instead of optimizing outcomes, the general rule is to optimize the expected outcome.
- ✓ For example – confronted with a choice between two actions.
- ✓ One offering a 2% probability of profit of 1,00,000/- and other an 80% probability of a profit of 10.000/- the national decision-maker will choose the second alternative because it gives higher expected value.

Outcome	X	Probability	=	Expected value
S1=1,00,000	X	0.02	=	2,000
S2=10,000	X	0.80	=	8,000

C. DECISION UNDER UNCERTAINTY

- ✓ It occurs when there are a number of outcomes for each alternative and the probabilities of their occurrence are not known.
- ✓ Optimization cannot be applied here because there is no knowledge of probabilities.
- ✓ Under such situation different people take decisions applying different decision rules.
- ✓ Some may assign equal probabilities to all the outcomes for each alternative, and treat as decision-making under risk, where as some others may adopt different criteria, such as to minimize regret, maximax and maximin criteria.

3.7 DECISION SUPPORT TECHNIQUES



1. SIMULATION

- In this approach, a mathematical model of the situation is created.
- Main decision variables are defined and the model is operated under different assumptions or with different starting conditions to help explore alternative paths for the real situation.

2. **OPTIMIZATION**

- In optimization technique, a mathematical model of the situation is developed.
- The model is designed so that optimization techniques can be used to search for optimal values of decision variables.

3. **OLAP AND DATA MINING**

It uses statistical techniques to analyze business results and find hidden relationships.

4. **EXPERT SYSTEMS**

Here an expert's view of an area of knowledge in terms of facts and rules are summarized and the facts and rules to a particular situation are applied to help someone else decide what to do.

5. **NEURAL NETWORK**

- It starts with a large set of coded examples that represents the range and frequency of possibilities in the situation being studied.
- Neural networks apply automated statistical learning techniques to find the statistical parameters that best present correlations between groups of characteristics within the trading sets.

6. **FUZZY LOGIC**

On this approach decision process are controlled using logic systems that replace either-or logic with logic based on relative degrees of inclusion in sets.

7. **CASE-BASED REASONING**

- This approach creates a database of examples that may help in making decision.
- Add another example to the database when the database does not cover a new situation.

8. INTELLLIGENT AGENTS

- In this techniques decision parameters are specified for a computerized agent that searches one or more databases to find a specific answer such as the lowest price for a parameter mobile set.

3.8 DECISION MAKING AND ROLE OF MIS:

- Herbert's A Simon's model of decision-making proposes three stages in the decision- making process.
- MIS plays its role in all the three stages.

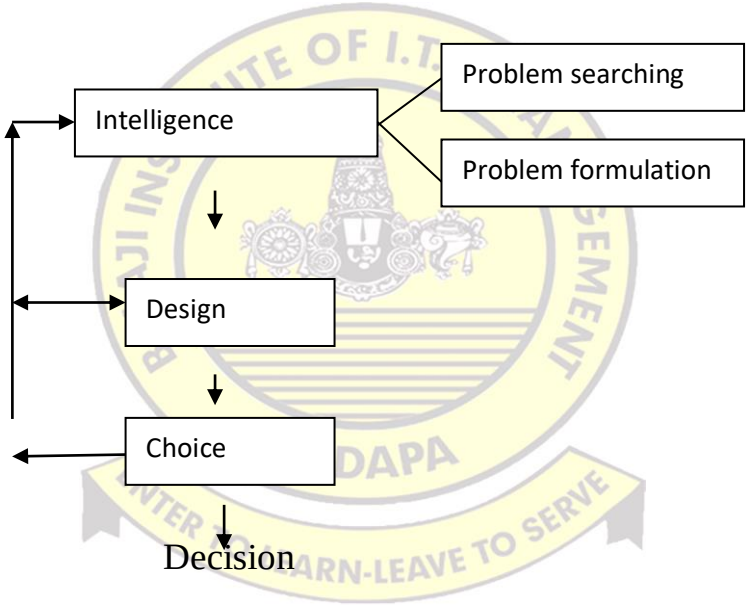


Figure: Decision Making Process

1. **INTELLIGENCE PHASE:** In this phase, the decision maker scans the environment and identifies the problem or opportunity.
   - In this stage, an information system may provide information about internal as well external environment.
   - Internal information is generated from the functional areas.
   - External information is collected from various sources such as databases newspapers, government reports, personal contacts etc.

a. PROBLEM SEARCHING

Problem is defines as the difference between something that is expected and reality.

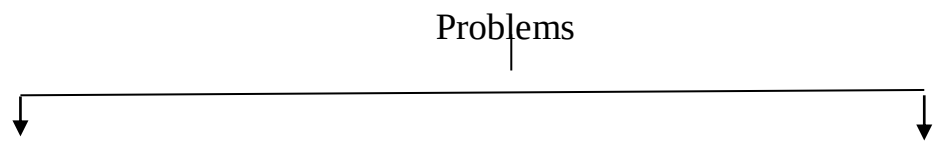
Difference (problem) = (desired/expected) – (actual/reality)

- ✓ Differences are measured and the differences are evaluated to determine whether there is any problem or not.
- ✓ Various types of models can be used to compare reality.
- ✓ Some of them are,
  a. Planning model
  b. Historical models based on extrapolation
  c. Models used by other people in the organization

FOR EXAMPLE: sales manager who has set a sales target of Rs. 5 lakh in one particular month and he could achieve only Rs 4 lakh worth of sales. Thus difference is Rs. 1lakh (5-4) which worries the manager.

b. PROBLEM FORMULATION (FORMATION OF CORRECT PROBLEM CAREFULLY)

- ✓ When the problem is identified , there is always a risk of solving the wrong problem.
- ✓ To avoid such risk, it is very important that the problem is well understood and clearly stated.



Process of clearly defining the problem Is sufficient

we have to simplify problem by determining its boundaries, by Breaking into Sub-problems.

- ✓ In problem formulation, establishing relations with some problem solved earlier or analogy proves quite useful.

2. DESIGN PHASE

- In this phase, the decision-maker identifies alternative courses of action to solve the problem.
- Inventing or developing of various alternatives is a time consuming and crucial (difficult) activity as the decision-maker has to explore all possible alternatives and he cannot take a risk of missing any alternative , as the missed-out alternative might be the best one.
- Developing alternatives is a creative activity which can be enhanced by various aids such as brain-storming, checklists, analogies etc.

3. CHOICE PHASE

- At this stage, one of the alternatives developed in design phase is selected and is called a decision.
- For selecting an alternative a detailed analysis of each and every alternative is made.

- However at any phase, the decision-maker may return to a previous phase.

  For example, the decision-maker in the choice phase may reject all alternatives and return to the design phase for developing more alternatives.

3.9. BUSINESS INTELLIGENCE (BI)

BI may be defines as knowledge about the

- The customer
- The competitors
- The business partners
- The competitive environment
- The internal operations

of the organization

- This knowledge, in turn enables the organization to make effective decisions that may have strategic implications for the business.
- BI enables an organization to extract the right meaning of information to take creative and important steps to get the competitive advantage.
- The **purpose of BI** is to improve the timelines and quality of the input for decision making.
- BI helps the managers to understand the following,

  - Internal capabilities of the organization
  - Trends and future directions in the markets
  - External environment such as economic, political social, technological and demographic environment
  - Behavior of the competitors.

- Business intelligence is a way to truly understand markets, competitors and processes.
- Software technology such as,

  - Data warehouses
  - Data marts
  - Data mining
  - OLAP (online analytical processing)

Makes it possible to find out trends and patterns that can be used by the organization to improve profitability.

The organizations that develop BI tools create interfaces that help the managers to quickly grasp business situations.

- Such an interface is simple to understand and interpret by the manager.
- **Example**: one of such interface is called dashboard, because it looks similar to a car dashboard.

- Visual images such as speedometer, indicators for periodic revenues, profits and other financial information such as bar charts, line graphs and other graphical representations are used in dashboards.

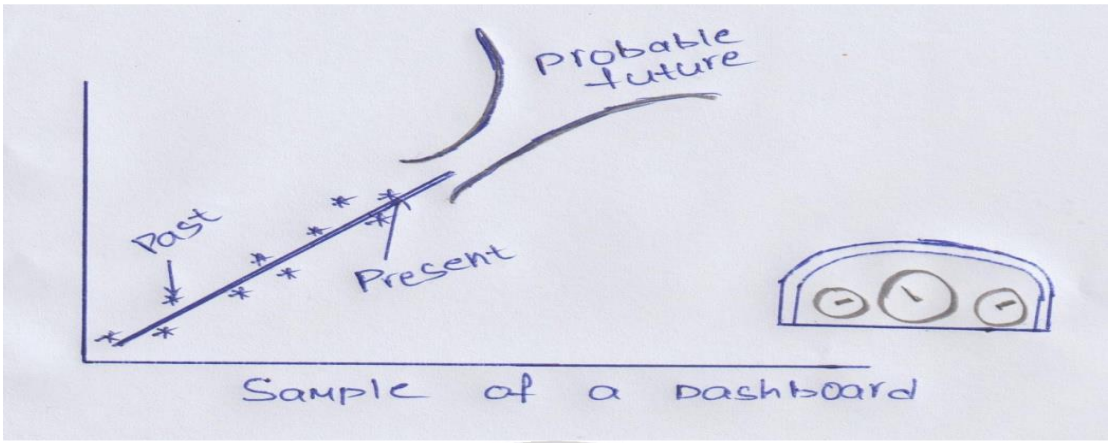
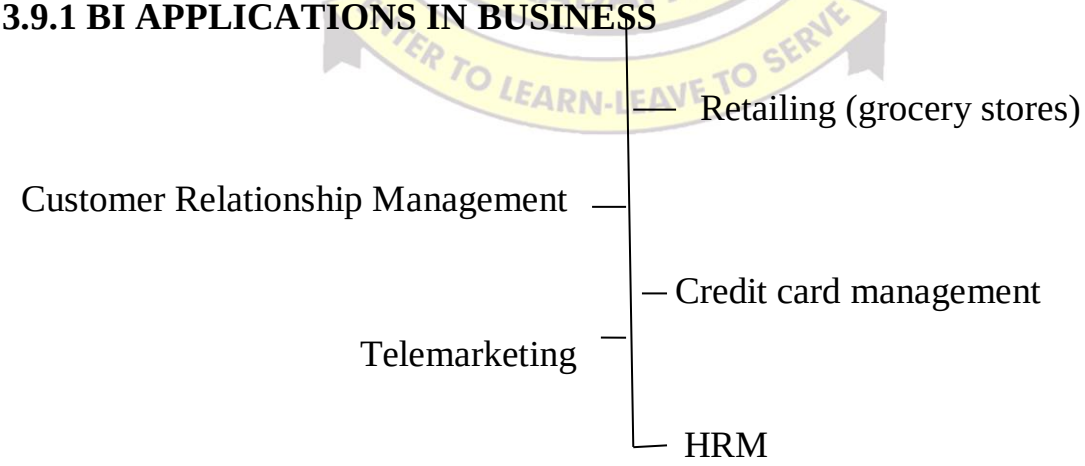


Figure shows sample of a dashboard

OLAP

- OLAP systems are multidimensional database. Such as product, geographic sales region, time period as a separate dimension.
- OLAP is computer processing that enables a user to easily and selectively extract and view data from different points of view.

3.9.1 BI APPLICATIONS IN BUSINESS



3.10. KNOWLEDGE MANAGEMNET SYSTEMS

KNOWLEDGE: Knowledge is the fact of knowing something with familiarity gained through experience or association.

K.M: K.M is defined as the management of the skills and experiences of those at an organization through certain programs and workshops that allow for understanding and implementation that can be done via discussion and interactions among colleagues.

BENEFITS

- Increase employee knowledge base.
- Increase customer satisfaction and needs
- Improves organization efficiency and effectiveness
- Avoiding repetitions of the same problem due to increased knowledge base.
- Improving decision making process by having expertise advice.
- Information and knowledge can now be available to all at the organization.
- The concept of knowledge has been shown in figure.

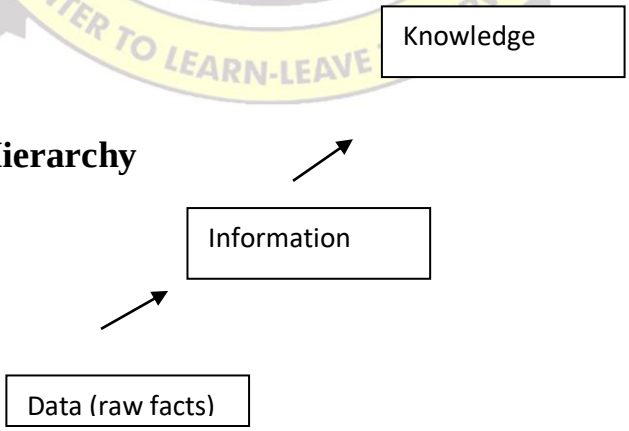


Figure: knowledge Hierarchy

DEFINITION

- KMS is defined as a strategy, a framework, combination of activities or a system that is designed to help organization create, capture, analyze,

apply and reuse knowledge to improve its performance and to achieve competitive advantage.

Knowledge

Explicit knowledge **Tacit knowledge**

Tangible, transferable and can be documented

Eg: databases, textbooks, formulae and equation etc.

intangible, non-transferable &Exist in the mind of persons

eg: experiences.

3.10.1CONCEPT OF KNOWLEDGE MANAGEMENT:

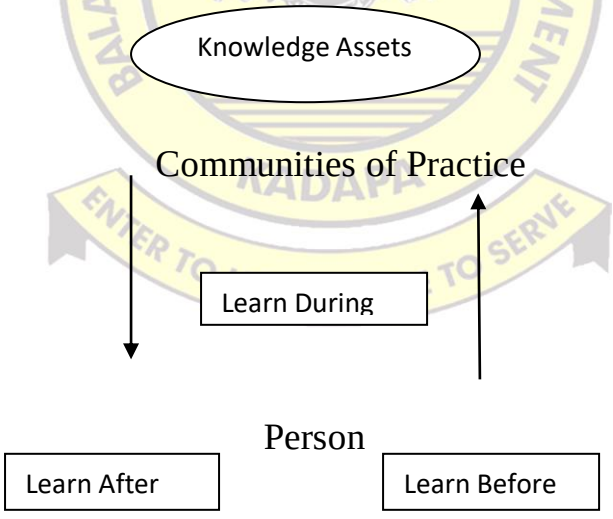


Figure: Knowledge Management Model

1. **A KNOWLEDGE ASSET**: It is validated knowledge, captured and stored for re-use
2. **LEARNING BEFORE**: knowledge accessed at the start of a project, to ensure that you start the work with a full knowledge base.

3. **LEARNING DURING**: New knowledge is identified and collected during implementation while work is in progress.

   So that operational plans can be changed immediately as new knowledge becomes available.

4. **LEARNING AFTER**: Upon completion of task, the knowledge is collected from all those who took part and collected for future use.
5. **COMMUNICATIONS OF PRACTICE**: These are networks dedicated to sharing knowledge among practitioners in order to help them practice better.

   EXAMPLE: these practitioners can be professionals.

Information Technology, now-a -days because of its capabilities in terms of both storage and communication is considered as a key enabler of KM and KMS.

3.10.2. K.M STRATEGIES

There are a number of strategies that can be formulated and implemented for the KMS in the organization.

1. What knowledge to share (sales marketing, research etc.)
2. With whom to share knowledge { internal audience (staff)) / External audience (raising complex Issues)
3. How will knowledge be shared (disks, telephones, fax, emails.)
4. Why will knowledge be shared (to increase speed, lower cost of operation, to increase client base.)

IF YOU CAN STAY POSITIVE IN A NEGATIVE SITUATION, YOU WIN.

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Icet Code: BIMK

SUBJECT: MANAGEMENT INFORMATION SYSTEM (MIS)

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UNIT-3

PREVIOUS YEAR QUESTIONS

1. **(a) Describe different types of decisions with examples.**
   (b)Explain how the decision-making process works.

OR

2. **(a)Discuss how business intelligence support decision making.**
   (b)Describe the major types of knowledge management systems ana applications of each type. (Jan 2020 Regular & Supply)

3. **(a) State the objectives of customer relationship management(CRM).**
   (b)Explain how information systems support each objective of CRM.

OR

4. **(a) Define 'supply chain management'(SCM)?Give the examples of SCM software.**
   (b)Illustrate the typical components of an enterprise resource planning system.(October 2020 supply)

5. **What are the steps involved in the decision making process.**

OR

6. **Give short note on (i) CRM. (ii) SCM. (iii)DSS (Dec/Jan 2018/19 regular & supply)**

7. **Explain the components of ERP and CRM.**

OR

8. **Explain about business intelligence and knowledge management systems.(dec/jan 2017/18 regular)**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

Course Code	MANAGEMENT INFORMATION SYSTEMS	L	T	P	C
21E00106		4	0	0	4
	Semester	**I**			

Course Objectives:

- To provide the basic concepts of data and Management Information System and utility of the MIS for the managerial decisions.
- To Explain Management of Information system, MIS design and implementation process in an organisation.
- To discuss security, ethical and social issues in management of Information system.

Course Outcomes (CO): Student will be able to

- Know Management of Information system scope, application and challenges in managing MIS.
- Understand traditional and modern approaches for data resource management and models.
- Evaluate product based and process based cost and benefit to implement and maintain MIS in an organization.

UNIT - I	Lecture Hrs: 8

MIS An overview- Introduction, Need for MIS and IT nature and scope of MIS, MIS characteristics, Structure of MIS, role of MIS in global business. Challenges of Managing MIS.

UNIT - II	Lecture Hrs: 12

Data resource management- Data base concepts, The traditional approaches, the modern approaches (Data base management approaches) DBMS, Data models, Data ware housing and mining.

UNIT - III	Lecture Hrs:12

Business application of IS- Enterprise systems, ERP, CRM, SCM, DSS, Types of decisions, Decision support techniques, Decision making and Role of MIS, Business intelligence and Knowledge management systems.

UNIT - IV	Lecture Hrs:12

Management of IS- Project planning, SDLC, System development models, Project management, system analysis, system design, Implementation process, Product based MIS evaluation, Cost /Benefit based evaluation, Process based calculation, System maintenance

UNIT - V	Lecture Hrs:12

Security, Ethical &Social Issues : IS security threats, Protecting IS,IS Security Technologies, The disaster recovery plan, IS Ethical Issues, social issues.

Textbooks:

1. MIS –Managerial Perspective, D.P.Goyal,Vikas Publications.
2. Management Information Systems Text & Cases, W S Jawadekar, Tata McGraw-Hill.

Reference Books:

1. Management Information Systems, C Laudon and Jane P.Laudon, et al, Pearson Education.
2. MIS, Hossein Bidgoli, Nilanjan Chattopadhyay, Cengage Learning
3. Introduction to Information Systems, Rainer, Turban, Potter, WILEY-India.
4. Management Information Systems, James A. Obrein, Tata McGraw-Hill .
5. Cases in MIS, Mahapartra,PHI.
6. Management Information Systems, Gordon B. Davis & Margrethe H.Olson, Tata McGraw-Hill .

Online Learning Resources:

https://onlinecourses.nptel.ac.in/noc20_mg60/preview
https://nptel.ac.in/courses/110/105/110105148/
https://onlinecourses.swayam2.ac.in/cec21_ge05/preview

UNIT-4

MANAGEMENT OF IS (INFORMATION SYSTEM)

4.1 PROJECT PLANNING:

INTRODUCTION

- Organization that plan their Information System (IS) tend to achieve better results than organization that do not, yet studies reveal that many organizations either do not plan for or do it unsystematically.
- As a result; without plan organizations may end up **spending money** on Information System (IS) that may not be required.
- In other words, such systems do not provide the required value to the business and may prove to be failures in the organization.
- Thus, it is important that the managers understand the IS planning process so as to apply and leverage the IT in the right way.

4.1.1 INFORMATION SYSTEM PLANNING:

- The business organizations today are quite complex, large and dynamic and exist in an ever increasing competition.
- Accordingly, they have to develop and update their Information System (IS) in a systematic way.
- This requires an overall plan for the IS in the organization.
- Creating an Information System plan (**CRIS PLAN**) is a process that comprises many steps , as indicated in figure,
- The IS plan is comprehensive one which is derived from the organizational strategic plan.
- The IS plan generally includes the **goals, objectives, structure of IS.**
- A plan acts as a basic for actions.

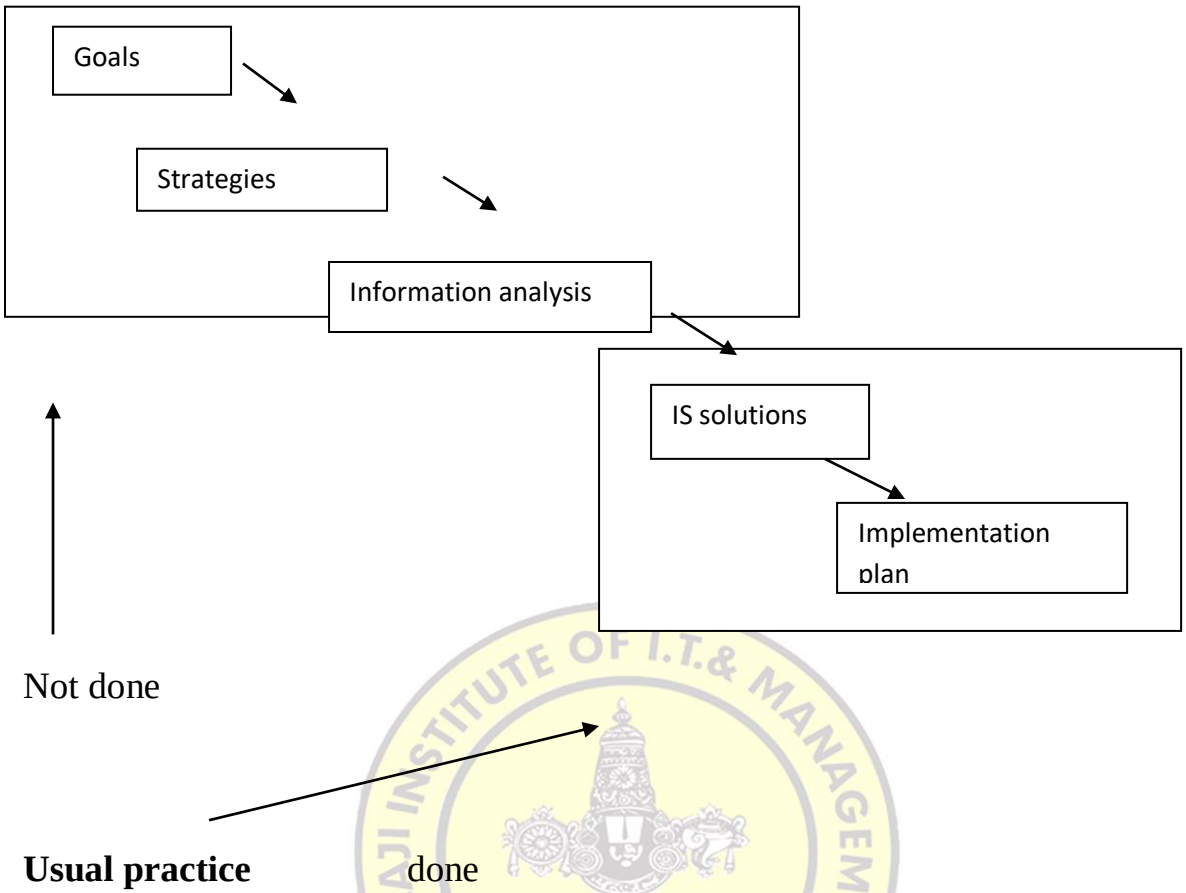


FIGURE: Creating Information System (IS) PLAN

4.1.2 CREATING AN IS PLAN (CRISP):

Aligning of IS with the business

- **Strategic analysis**
- **Information analysis**

Identification of IS solutions

- **Prioritization of ISs**

1. **STRATEGIC ANALYSIS:**

- ❖ Strategic analysis refers to the formulation of Mission, goals and strategies for the organization.
- ❖ Various models like SWOT analysis, stages growth model, value chain model etc., are applied.

2. **ALIGNING OF IS, WITH THE BUSINESS:**

- ❖ In this stage, mission, goals and strategies of **IS** are derived from the mission goals and strategies of the **organization.**

TECHNIQUES USED FOR ALIGNING THE BUSINESS WITH THE REQUIRED IS (INFORMATION SYSTEMS):

a. Derivation from the organizational plan
b. The strategic information system grid
c. Strategic fit with organizational culture

3. **INFORMATION ANALYSIS:(Information requirements of managers):**

- ❖ After the strategic planning stage, in which goals, objectives and strategies for IS are formulated we need to determined the information requirements of the managers which is done in this stage.
- ❖ It needs to be understood that this stage does deal with the detailed information requirement analysis, rather current and future needs for ISs to support decision- making and operations of the organization are assessed.

To undertake information requirements analysis the followed steps are followed:

a. **Define Underlying Organizational Requirements:** Underlying Organization sub-systems are defined

   For Example, the major processes for a computer training institute may include (Advertising, accounts receivable, faculty administration, computer maintenance, credit, audit etc.)

b. Develop Sub-System Matrix:

Relate specific managers to organizational sub systems.

The matrix thus prepared is known as manages sub-system matrix.

Organizational sub system	Manager-1	Manager-2	Manager-3
Advertising	X		
Accounts receivable		X	
Faculty Administration		X	
Computer maintenance	X		

Figure: manager by sub system matrix

c. Determine the critical information requirements:

In this phase, information requirements of each sub system are obtained.

- Commonly used approaches namely Business System Planning (BSP), Critical Success Factors (CSF) Etc.

4. IDENTIFYING IS SOLUTIONS:

The IS that need to be developed or the proposed changes that are identified to be done in the existing system, become the candidate systems for the proposed IS solutions.

For example: in a business school the following IS solutions need to be deployed.

Online admissions, online academics, online placement, online administrations, online research, online library etc.

5. PRIORITIZATION OF ISs:

- Having identified the need for IS applications for the entire organization the next step of IS planning process is the prioritization of IS applications.
- As the resources in terms of manpower and financial resources may be limited and not all IS applications may be developed at once, it becomes important to identify which applications are to be developed and in what order.
- The value of ISs may not necessarily be assigned in rupees, sometimes, it is important to access the IS value.
- The organizational readiness is seen in terms of,
  - People issues
  - Date issues
  - Integrations/links with other systems/external links
  - Technology issues
  - Other issues.

Info systems	People issue	Date issues	Integration	Technology	Other
Online academics					
Online admissions					
Online placemen placement					

Figure: prioritization of IS applications

4.1.3 RESOURCE ALLOCATION:

This stage provides the framework for personnel planning, technology procurement and budgeting to provide services to users.

a. Return on investments (ROI)

b. Change out
c. Portfolio approach
d. Steering committee approach

4.1.4 PROJECT PLANNING:

Having decided the requirements of IS applications and the sequence in which these applications are to be implemented in the organization management needs to take a decision whether to develop these applications in house get them developed from the vendors. A wide variety of tools of project management are available which include milestones, Critical Path Method (CPM), Gantt charts and so on.

4.2. SDLC (SYSTEM DEVELOPMENT LIFE CYCLE)

INTRODUCTION

- It is important to understand that the knowledge of the system development process is important to not only the **system analyst** but also the **Business managers** working in an organization.
- Many a time, the IS fail because of the mismatch between the thinking of the managers and that of the technical persons on the development issues.
- **Business managers** may also have the perception that the IT department would solve all their problems and thus may have high expectations from the technical team.
- On the other side, **system analyst** may not understand the business and business processes, and thus may not completely understand the requirements of their managers.
- As a result the technical team would end up developing IS (Information System), which may not cater to the needs of the managers.
- Sometimes, the IS development project is not properly planned, monitored controlled, and thus leads to the failure of the developed IS.

4.2.1 SDLC (SYSTEM DEVELOPMENT LIFE CYCLE):

System development is regarded as another form of problem solving in software which consists of activities such as following,

1. Understanding the problem
2. Deciding a plan for a solution
3. Coding the planned solutions
4. Testing the coded program
5. Installing the system

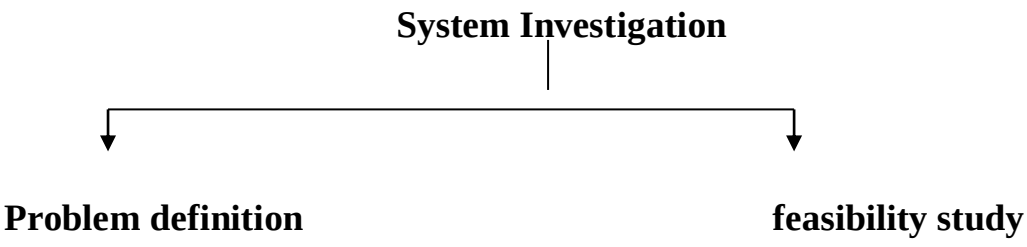
In order to develop a system successfully, it is managed by breaking the total development process into smaller basic activities.

- Any system development process, in general is understood to have the following phases.

1. **System Investigation**
2. **Analysis**
3. **Design**
4. **Constructions**
5. **Implementation**
6. **Maintenance**

1. SYSTEM INVESTIGATION:

- ❖ Some problem may be bothering a business organization. The managers in the organization (users) may or may not be very clear about the problem
- ❖ The user may invite a system analyst to assist him/her in defining and resolving the problem in a clear way.



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Some possible definitions of a problem are

- The existing system has a poor Response time, i.e. it is slow. — Organizational feasibility.
- It's unable to handle the workload. — Economic feasibility.
- The problem of cost, i.e. the existing System is not economical — Technical feasibility.
- The problem of accuracy & reliability — Operational feasibility.
- The problem of security.

a. PROBLEM DEFINITION:

- ✓ Although the need for problem definition may seem obvious ,this is perhaps the most frequently bypassed step in the entire system development process.
- ✓ So the first responsibility of a system analyst is to prepare a written statement of the objectives and scope of the problem.
- ✓ In other words, proper understanding and definition of the problem is essential to discover the cause of the problem and to plan a directed investigation by asking questions such as what is being done? Why?
- ✓ Similarly a system analyst should provide a rough estimate of the cost involve for the system development. This is again a very important question that is too often not asked until it is quite late in the system development process.

b. FEASIBILITY STUDY:

- ✓ The literal meaning of feasibility is viability.
- ✓ This study is undertaken to know the likelihood of the system being useful to the organizations.

- ✓ Feasibility study basically is a high-level capsule version of the entire process intended to answer a number of questions such as what is the problem? Is the problem even worth solving?

  The aim of a feasibility study is to access alternative systems and to propose the most feasible and desirable systems for development.
- ✓ Thus, a feasibility study provides an overview of the problem and acts as an important checkpoint that should be completed before committing more resources.

i. ORGANISATIONAL FEASIBILITY:

The extent to which a proposed IS(Information System) supports the objective of the organizations strategic plan for IS determines the organizational feasibility of the system project. The IS must be taken as a subject of the whole organizations.

ii. ECONOMIC FEASIBILITY:

- In this study, **costs and returns** are evaluated to know whether returns justify the investment in the system project.
- The economic questions raised by analyst during the preliminary investigation are for the purpose of estimating the following,
  a. The cost of conducting a full system investigation
  b. The cost of hardware and software for the class of application being considered.
  c. The benefits in the form of reduced costs, improved customer service, improved resource utilization or fewer costly errors.

iii. TECHNICAL FEASIBILITY:

- Whether reliable hardware and software capable of meeting the needs of the proposed system can be acquired or developed by the organization in the required time is a major concern of the technical feasibility.
- In other words, technical feasibility includes questions such as,

a. Does the necessary technology exist to do what is suggested and can it be acquired?
b. Does the proposed equipment have the technical capacity to hold the data required to use the new system?
c. Can the system be expanded?
d. Is there any technical surety of accuracy, reliability, ease of access and data security?

iv. OPERATIONAL FEASIBILITY:

- The willingness and ability of the **management, employees, customers, suppliers** etc, to operate, use and support a proposed system come under operational feasibility.
- The following questions are asked in operational feasibility.

a. Is there sufficient support from
   (i) The management
   (ii) Employees
   (iii) Customers
   (iv) Suppliers
b. Are current business methods acceptable to the users?
c. Have the users been involved in the planning and development of the system project?

Operational feasibility world pass the test if the system is developed as per rules, regulations, laws, organizations culture, union agreements etc, and above all with the active involvement of the users.

2. SYSTEM ANALYSIS

❖ Analysis is a detailed study of the various operations of a business activity (system) along with its boundaries.
❖ **The objectives of this phase are to determine exactly what just be done to solve the problem.**
❖ System analysis involves a detailed study of the following.

(i) The information needs of the organization and its end users

(ii) Existing information system, their activities ,resources products

(iii) The expected information system

The final product of a system analysis is a set of system requirements of a proposed IS.

The analysis phase provides the analyst with a clear understanding of what is to be done.

3. SYSTEM DESIGN:

- A system analysis describes WHAT a system should do to meet the information needs users.
- A system design specifies HOW the system will accomplish these objectives.
- The term **design** refers to the technical specification that will be implied in constructing the system
- A system design should stress on the following three activities,
  - (i) User interface (focuses on designing the interactions between end users & computer systems).
  - (ii) Data design (focus on the design of the logical structure of database and files to be used by the proposed IS)
  - (iii) Process design (focuses on the design of the software resources i.e. the programs and procedures needed by the proposed IS).

4. CONSTRUCTION AND TESTING:

- Ones the system specifications are understood, the system is physically created. The required programs are coded, debugged and documented.
- In fact, construction of the system takes place on the basis of the system design specifications.
- The system would be tested with some test data to ensure its accuracy and reliability.

5. IMPLEMENTATION:

- The system implementation stage involves hardware and software acquisition, site preparation , user training and installation of the system.
- Implementation is the most crucial phase of SDLC, because this step is vital in assuring the success of any newly developed system.
- Even a well-designed system will fail if it is not properly implemented.

6. MAINTENANCE:

- It involves **monitoring, evaluating and modifying** a system to make desirable or necessary improvements.
- Maintenance includes **enhancements, modifications** or any change from the original specifications.

4.3. SYSTEM DEVELOPMENT MODELS:

- In order to make sure that the systems are analyzed and designed efficiently and effectively, it is essential to adopt a suitable model, for which a basic understanding of various system development approaches / models currently in use is a must.
- As has already been discussed, the development process consists of activities namely investigation, analysis, construction, implementation and maintenance.

A system development model specifies how these activities are organized in the total system development effort.

The various models for system development are as follows,

1. **Waterfall model.**
2. **Prototyping model**
3. **Interactive enhancement model**
4. **Spiral model**
5. **4GT model**
6. **Hybrid model**

1. WATERFALL MODEL:

- Waterfall model which follows the SDLC approach became popular in the 1970's.
- The model states that the phases are organized in a linear order.
- In other words, the output of one phase becomes the input for the next phase.

In SDLC approaches the system is visualized as a living organism. The system takes birth reaches the maturity stage through adolescence and ultimately dies its natural death.

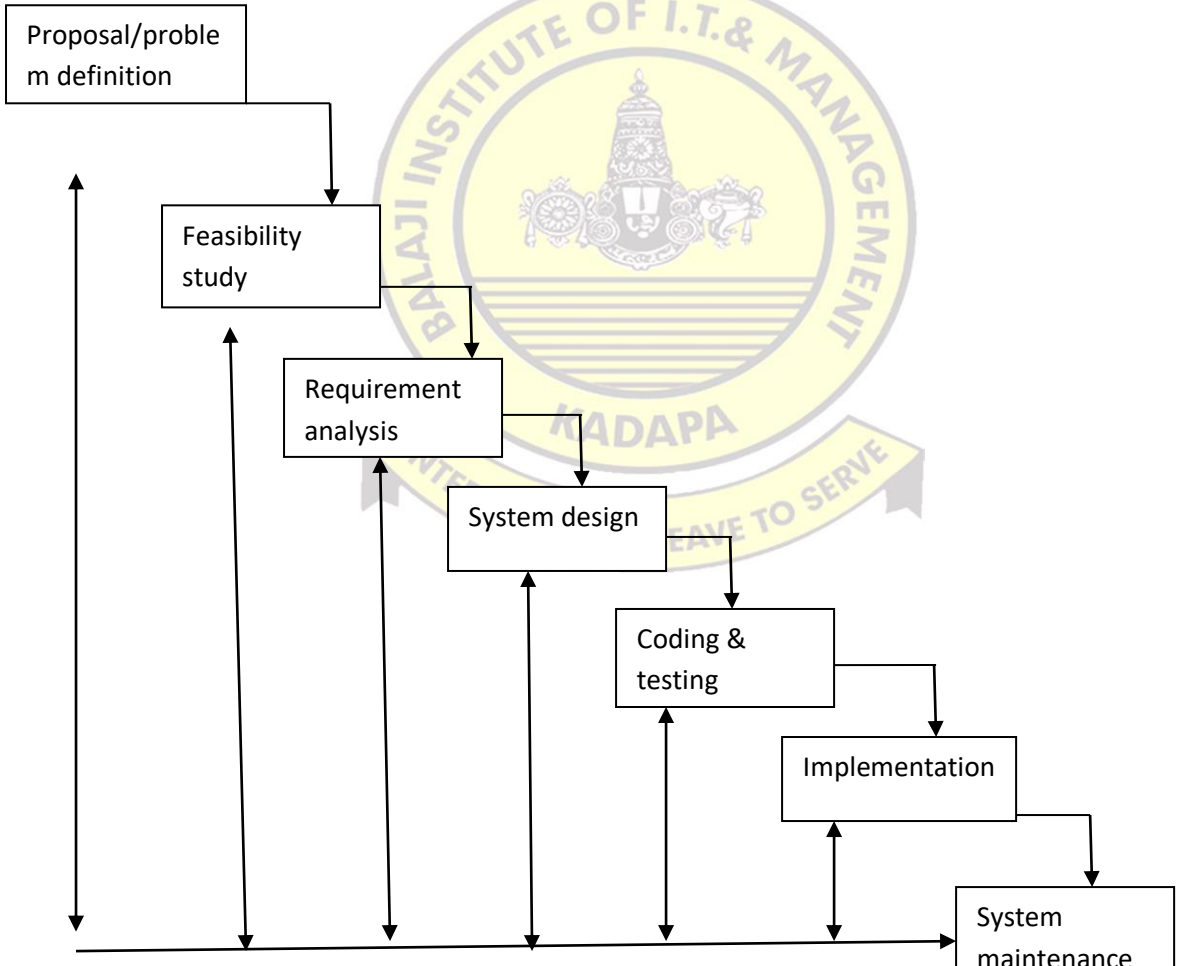


FIG: WATERFALL MODEL

ADVANTAGES OF WATERFALL MODEL:

- ✓ This waterfall model is simple and thus easy to understand.
- ✓ Each phase has specific deliverables.
- ✓ Quality of the IS(Information System) ensured as each and every phase is well defined and distinct.
- ✓ **LIMITATIONS OF WATERFALL MODEL:**
- ✓ Does not show overlap between phases
- ✓ High amounts of risks and uncertainty
- ✓ Not a good model for complex and object-oriented projects
- ✓ A phase should not start until the previous phase is signed off.

2. PROTOTYPING MODEL:

- In the prototyping approach, a prototype of the system is developed, instead of the complete system
- A prototype is a comprehensive system and does not include all the requirements of the user.
- This model is based on the evolutionary method of system development.
- Prototyping is used in those systems, in which identification of requirements is difficult and requirements may change during the development process.

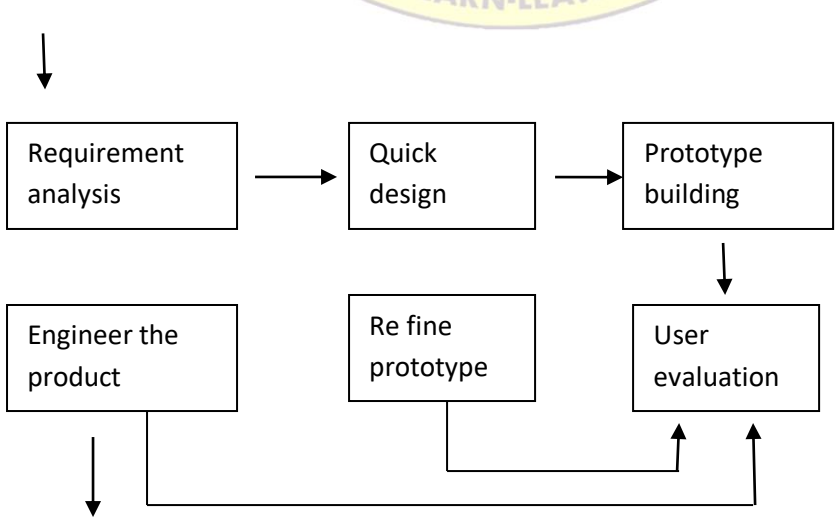


Figure: prototype model

THE MODEL IN GENERAL HAS THE FOLLOWING FOUR STEPS,

1. IDENTIFY THE USER'S BASIC INFORMATION REQUIREMENTS:

- In this step the user identifies his requirements in the form of outputs required from the system.
- The information analyst on the basis of user expectations,estimates the cost of a workplace prototype.

2. DEVELOP THE INITIAL PROTOTYPE SYSTEM:

- Here the initial prototype system which meets the user's basic information requirements is developed.
- It is developed in the minimum possible time.
- The speed of building, rather than efficiency of the prototype are the main consideration.

3. USE OF THE PROTOTYPE SYSTEM TO REFINE THE USER'S REQUIREMENTS:

The initially developed prototype is delivered to the user to allow him to gain a hands-on experience with the system and to identify further changes required in the prototype.

4. REVISE AND ENHANCE THE PROTOTYPE SYSTEM:

- In this stage the designed makes the necessary changes pointed out by the user after using the prototype.
- Steps 3 & 4 are repeated till the prototype is refined to the satisfaction of the user.
- The prototyping approach may not be cost-effective in small organizations.
- It is more suitable for larger organizations ,where it is difficult to identify user requirements.

ADVANTAGES:

✓ Ability to "tryout" ideas without incurring large costs.

✓ Lower overall development costs when requirements change frequently.

✓ The ability to get a functioning system into the hands of the user quickly.

DISADVANTAGES:

- ✓ A major criticism of this approach is because of its iterative nature. This approach requires at least two iterations. Moreover it may become an unending process of refinement, which may make too much time, effort and money.
- ✓ Due to frequent changes, management of the development process.

3. ITERATIVE ENHANCEMENT MODEL:

- ✓ In an iterative enhancement model, the system is developed in increments and each increment adds some functional capabilities to the system, until the full system is developed.
- ✓ Additions and modifications can be done at each step.
- ✓ The iterative enhancement process model is understood to have only three phases, namely **analysis, implementation and design** as shown in figure.

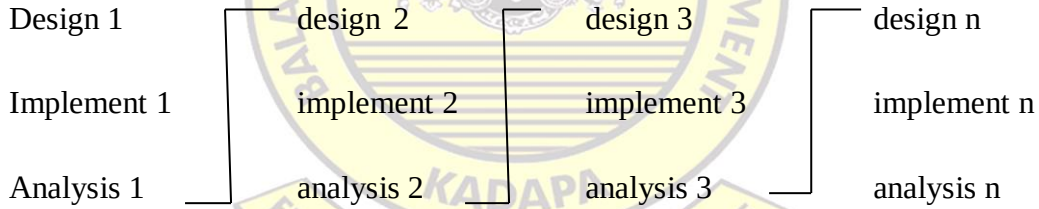


Figure: The iterative enhancement model

MERITS:

- It result in better testing, as testing each increment is relatively easier than testing the entire system similar to the waterfall model.
- Further as in prototyping the increments provide feedback to the user, which is useful for determining the final requirements of the system.

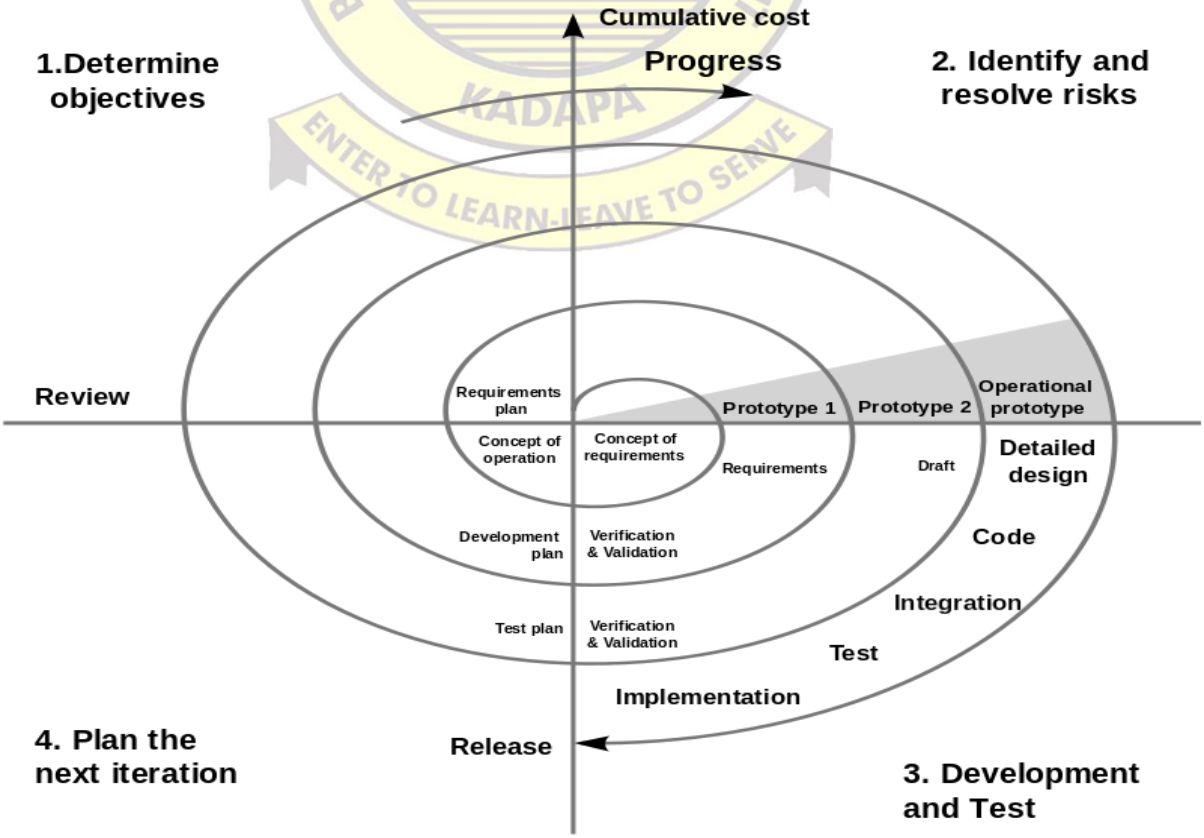
Thus the iterative enhancement model combines the benefits of both prototyping and the waterfall models.

LIMITATIONS:

- The model does not give a complete system and thus many of the details may not be incorporated in the developed system.
- As the model is based on **modify-it-again** approach it may be time-consuming and is not cost effective.

4. SPIRAL MODEL

- The spiral model is the most recent system development model which has been proposed by **BOEHM.**
- This model suggests that the various activities involved in system development should be organized like a **spiral.**
- This model as the name indicates is cyclic in nature as shown in figure.
- Each cycle of the spiral consists of four stages represented by each quadrant.
- The angular dimension represents the progress in the development process, where as the radius of the spiral represent the cost involved.



The spiral model is more suitable for high-risk projects. For small projects, this model may not be time and cost-effective.

5. 4GT (FOURTH GENERATION TECHNIQUE):

- 4GT is being used to quickly developed IS.
- This technique makes use of a number of software development tools.
- The developer has to specify only a few characteristics of the software at a high level.
- The tools then automatically develop the code for the given specifications.
- This model, no doubt is quick but its success is restricted by the capacity of the available fourth generation languages (4GLs)
- However the model may be useful for smaller projects.

6. HYBRID MODEL(combination of more than one model):

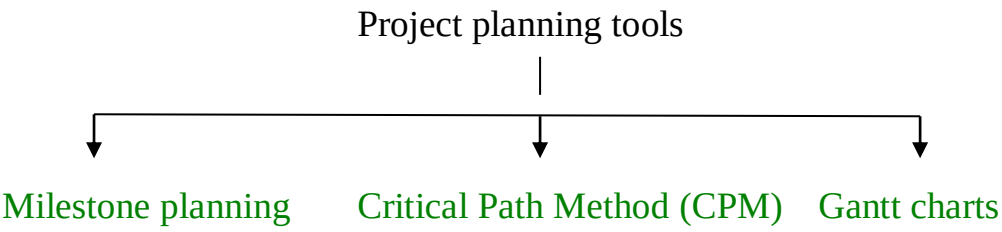
- It may be noted that the different approaches discussed above are used as supplementary rather than complementary approaches to software development.
- Depending upon the nature and size of the project and the risk involved therein a combination of more than one model (hybrid approach) may be an appropriate strategy.

4.4. PROJECT MANAGEMENT

- After the decision on whether the proposed IS solutions are to be built or to be purchased, the proposal for the same is put before the approving authority for its approval.
- Once approved, the proposed IS solutions become the **projects** to be undertaken for implementation.

- Thus, the phase- wise IS solutions are taken up, which needs a proper planning about all the required activities to complete the project within the available time and cost, and also to ensure the quality output from the IS.

4.1 PROJECT PLANNING TOOLS:



1. MILESTONE PLANNING/check point planning:

- In milestone planning techniques, all project requirements and **problems are not anticipated in advance;** rather these techniques allow projects to evolve as they are developed.
- Milestone is established to allow periodic reviews of progress so the management may assess if a project needs more resources or requires adjustments, or if it should be abandoned.

2. CRITICAL PATH METHOD (CPM) / NETWORK ANALYSIS:

- In this method, various tasks require to complete a project are represented in the form of a network chart.
- This method establishes sequential dependencies and relationships among the tasks.
- Longest path in terms of time – total time required to complete the project.

  Longest path – critical path
- Any delay of tasks in the critical path would result in a corresponding delay in the overall project.

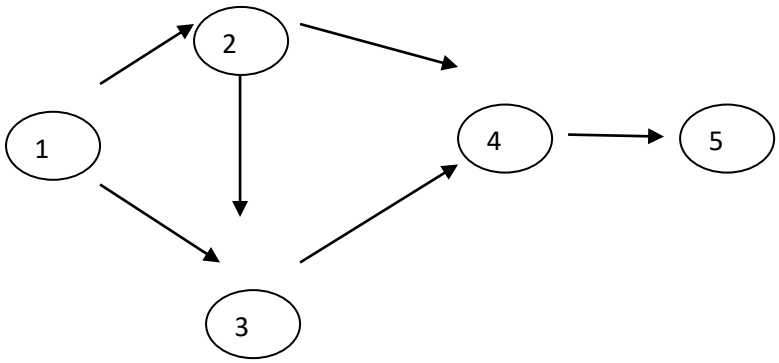


Figure: A Network Showing Critical Path

3. GANTT CHART:

- This is another planning technique similar to CPM, which provides definitions of tasks to be performance and specifies when they are to start and finish.
- However similar to a CPM chart ,a Gantt chart does not establish sequential dependencies.

Activities	May	June	July	September
System analysis				
System design				
Conversion				
Testing				
implementation				

Figure: Gantt chart

PROJECT MANAGEMENT FRAME WORK:

- MIS project management refers to an overall framework for the planning of all the activities to be undertaken, and scheduling and controlling of those activities.
- The various activities for IS (Information System) project management are,

1. **Identification of various tasks to be undertaken for the project.**
2. **Determination of the order of sequence in which these activities may be undertaken.**
3. **Assessment of risk and mitigation strategies**
4. **Allocate resources to each and every activity**
5. **Monitor the progress and corrective action.**

1. Identification of various tasks to be undertaken for the project:

The various activities involved in MIS implementation process are as follows,

- ✓ Preparation of the implementation plan.
- ✓ Formation of steering committee.
- ✓ Acquisition of facilities.
- ✓ Analysis and redesign of business process
- ✓ Systems design, coding and testing
- ✓ Acquisition of IT infrastructure
- ✓ User's training
- ✓ Conversion of data
- ✓ Documentation
- ✓ Changeover to the new system
- ✓ Change management
- ✓ Evaluation and maintenance

2. **Determination of the order of sequence in which these activities may be undertaken**:

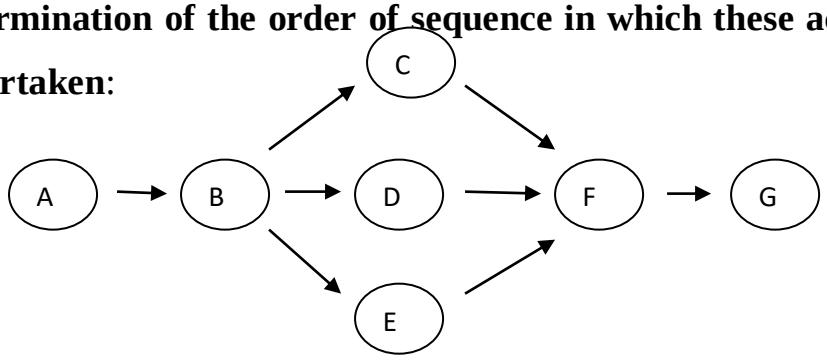


Figure: A Typical Network Diagram Showing The Sequence Of Various Activities

3. Assessment of risk and mitigation strategies:

- ✓ A risk may be defined as the likelihood of a given outcome and the magnitude of the occurrence.
- ✓ There may be many risks associated with the implementation of MIS systems.
- ✓ In order to make sure that the process of MIS implementation is smooth and MIS systems are meeting the goals and strategies of the organization, the project manager must assess all the risks and prepare a plan for the mitigation, monitoring and management of these risks.

4. Allocate resources to each and every activity:

- ✓ Once the order of activities is known, the appropriate resources in terms of **time, people and money are allocated.**
- ✓ The project milestones, which are sub-goals to be achieved over a period of time (per month and per week) are defined and a month-wise or weak-wise schedule is prepared so that the MIS team can have benchmark for performance and may adhere to these defined milestones.

- ✓ An example of milestone is existed in table.

S.NO	ACTIVITY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5
1	Preliminary investigation					
2	Systems analysis					
3	System design					
4	System coding					
5	System testing					

6	Acquisition of infrastructure					
7	System implementation					

Table: project activities and milestones.

Figure depicts diagrammatic representation of sequence and allocation of resources using MS project.

5. Monitor the progress and corrective action:

- In this step, the progress of various activities is monitored to see whether the MIS implementation is progressing as per the plan or not.
- If there are deviations between the actual and the planned activities, the corrective steps are taken to bring the MIS project implementation on track.

4.5 SYSTEM ANALYSIS

- It has been observed that many of the IS systems fail as they are not able to provide the required information to the users.
- This failure of ISs may be attributed to the fact that at the time of understanding the information requirements, the systems are not properly understood because of the communication gap between the user and the system analyst.
- For the illustration purpose, the communication gap between the user and the technical professional is depicted in figure.
- Thus, it becomes important for the managers to understand the systems analysis and system design to help the systems analyst understand all the information requirements for designing an efficient and effective IS.

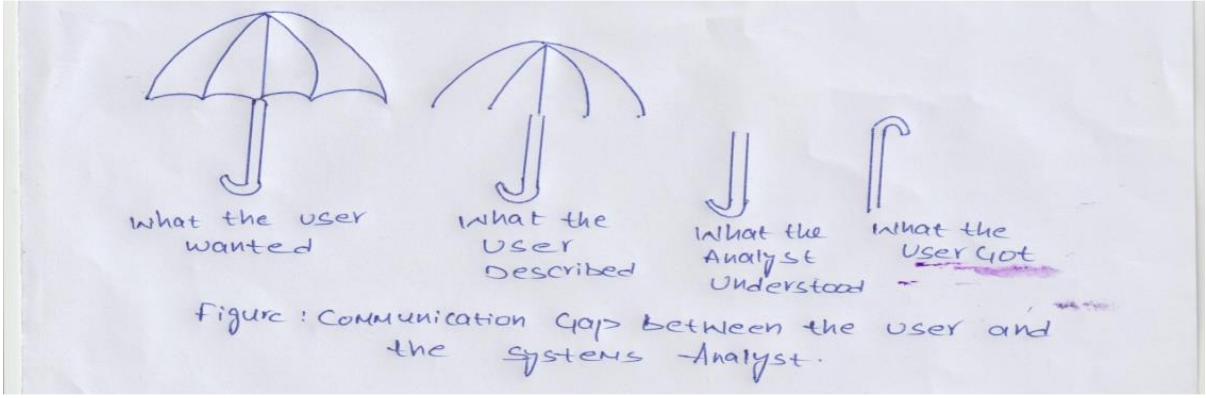


Figure : Communication Gap between the user and the systems Analyst.

4.5.1 SYSTEM ANALYSIS:

- System analysis may be understood as a process of collecting and interpreting facts, identifying problems and using the information to recommend improvements in the system.
- In other words, system analysis means Identification, Understanding and Examining the system for achieving predetermined goals/objectives of the system
- Systems analysis is carried out with the following two objectives
  1. **To know how a system currently operates and**
  2. **To identify the users requirements in the proposed system**
- Systems analysis is regarded as a logical process
- The emphasis in this phase is on the investigation to know how the systems is currently operating and to determine what must be done to solve the problem
- The systems analysis phase is very important in the total development efforts of a system
- The user may be aware of the problem but may not allow how to solve it.
- During system analysis the developers (system designer) works with the user to develop a logical model of the system
- A system analyst, because of the communication gap between him and the user,may not understand all the information requirements and may even move too quickly to program design, thus trying to skip this phase.

- In order to avoid this, the systems analyst must involve the user at this stage to get complete information about the system
- This can be achieved if a logical model of the system is developed on the basis of a detailed study
- Such a study (analysis) should be done by using various **tools and techniques** such as.

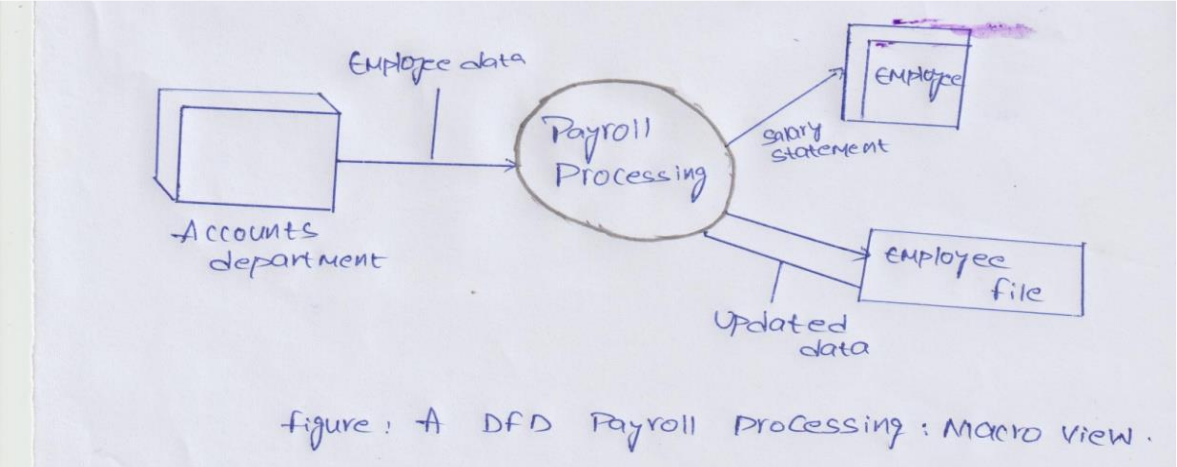
1. **Data flow diagram**
2. **Data dictionary**
3. **Structured English**
4. **Decision trees**
5. **Decision tables.**

structured analysis tools

1. DATA FLOW DIAGRAM (DFD)/BUBBLE CHART:

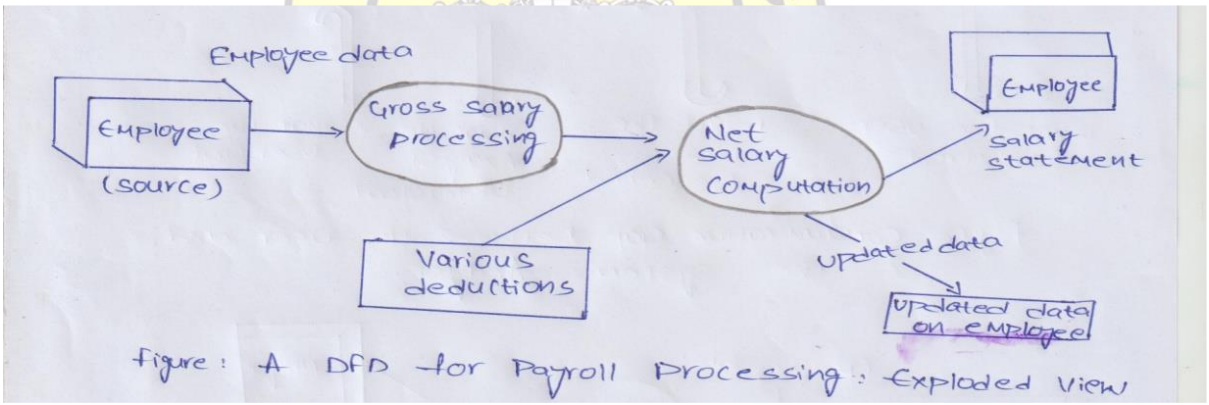
- ✓ DFD is **a graphical representation** of the logical flow of data.
- ✓ It helps in expressing the systems requirements in a simple and understandable form
- ✓ A DFD consists of a series of bubble joined by lines representing data flow in the system
- ✓ DFD is very effective, when the required design is to clear and the user and the analyst require some symbolic representations for communication.
- ✓ The main disadvantage of a DFD is that a large number of iterations are often required to arrive at an accurate and complete solution
- ✓ For example, consider the case of a **payroll system** to prepare salary statements for each employee of an organization. Dataflow for such a system can be represented as shown in figure.

Employees data originate from accounts department (source), gets processed, salary statements are received by employee and updated data on employee



(example: Total tax deducted, PF contribution etc.,) is stored in an intermediate file (data store),which is required for processing in the subsequent months.

- A DFD displays dataflow in a top-down approach
- To draw a DFD, start with a macro DFD (overview) and then explode it into micro DFDs .Figure illustrates the method.



While exploding a DFD into lower levels ,continuity and linkage is maintained between a DFD and its member DFDs

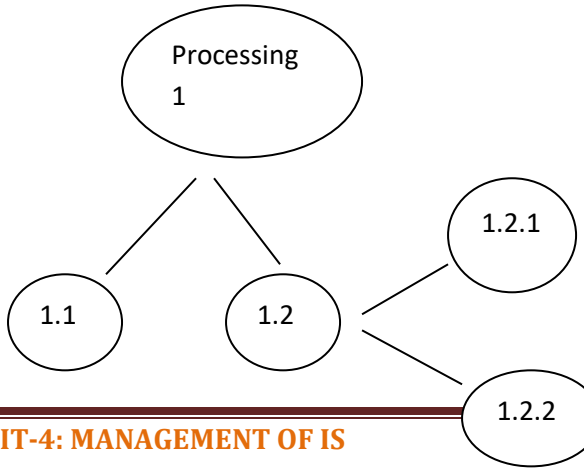
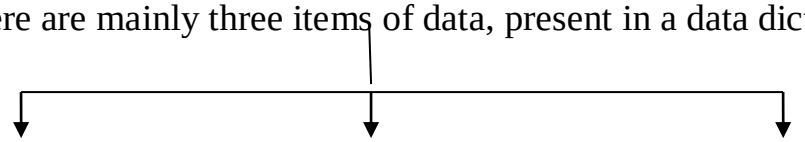


Figure: Explosion of DFD

2. DATA DICTIONARY

- A data dictionary is a structured repository of data.
- In order words it is a set of precise and accurate definitions of all DFDs, data elements and data structures.
- It improves communication between the user and analyst
- It can solve as a common database for programmers and can also be used for control purpose.

There are mainly three items of data, present in a data dictionary



Data element **data structures** **data flows and data stores**

1. **DATA ELEMENT**: it is the smallest unit of data and cannot be decomposed further.
2. **DATA STRUCTURE**: it is a group of data elements handled as a unit. A data structure contains a number of data elements as its field.
3. **DATA FLOWS AND DATA STORES**: data flows are nothing but data structures in motion.

   Data stores are data structures at rest. Data stores are locations where data structures are temporarily stores.

Various symbols which are used in the data dictionary are explained in table.

SYMBOLS	MEANING
=	Is equivalent to
+	Add
(option 1 (Option 2)	Only one of the options is used at a given time
Max	Iterations of the component
(component)	Min=lowest possible number of iterations

Min	Max=highest possible number of iterations
(component)	Component is an optional one
*Comment	Words within asterisks are comments

Table: symbols used in data dictionary

EXAMPLE:

VENDOR-INVOICE = INVOICE-NUMBER+VENDOR-NAME+TOTAL-INVOICE-AMOUNT+INVOICE-DUE-DATE+ (SHIPPING-DATA)

ITEM-DETAIL-LINE

One extra copy may be kept.

Data dictionary and DFD are correlated and data should be present in a specification.

However, a Data Dictionary (DD) does not provide functional details and thus is not very acceptable among technical users.

3. DECISION TREES

- The logic of the process which may not be very clear through Data Dictionary (DD), can easily be represented using a graphic representation which looks like the branches of a tree called "Decision Tree."
- A decision tree has as many branches as there are logical alternatives.
- It is easy to construct, read and update.

For example, a policy can be shown through a decision tree

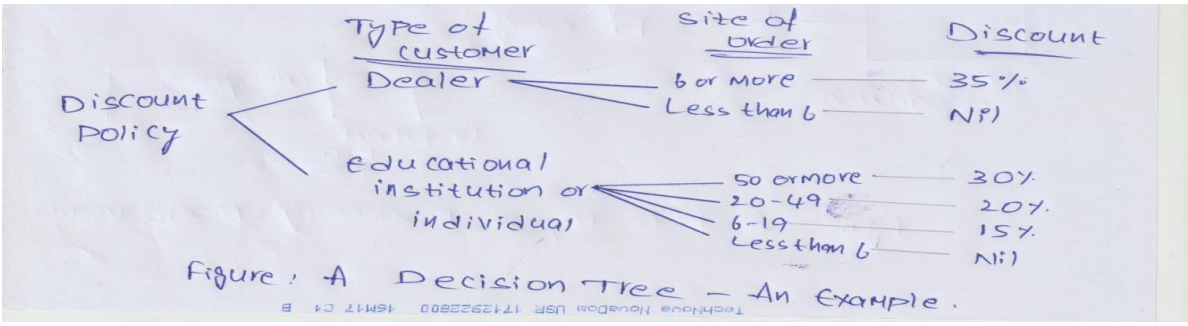


Figure : A Decision Tree – An Example.

4. STRUCTURED ENGLISH:

- Alternatively the discount policy can be represented by using structured English. The structured English uses logical construction and imperative sentences designed to carry out instructions for actions.
- Decisions are made through IF – THEN – ELSE statements.
- For example the process ORDER may have the data element ORDER-SIZE, which defines certain values,
- Using these values, structured English would read as shown in figure.

```
MINIMOM: 5or more personal computers ,per PC type.
SMALL: 6to 19PCS
MEDIUM: 20 to 49PCs
LARGE: 50 or more PCs
```

```
DISCOUNT- POLICY
Add up the number of PCs per PC type
If order is from the dealer
And – if ORDER-SIZE  IS SMALL OR MEDIUM OR LARGE
        THEN:Discount is 35%
ELSE (ORER-SIZE IS MINIMUM,
        SO:NO DISCOUNT IS ALLOWED
ELSE (ORDER IS FROM EUCATIONAL INSTITUTIONS)
SO –IF ORDER-SIZE IS LARGE
        DISCOUNT IS 30%
ELSE-IF ORDER – SIZE is MEDIUM
        Discount is 20%
ELSE-IF ORDER –SIZE is SMALL
        Discount is 15%
ELSE ORDER – SIZE is MINIMUM
        So no discount is allowed.
```

Figure: structured English – an example

Decision trees can be sued to verify logic in problems that involve few complex decisions, resulting in a limited number of actions. However, its biggest limitation is the lack of information due to its structure.

5. DECISION TABLE

- Decision table is a matrix of rows and columns that shows conditions and actions.
- Decision rules state the procedure to be followed when certain conditions exist.
- Decision table are best-suited for dealing with complex branching routines, example, inventory control etc.
- A decision table consists of four sections
    - A condition stub at the upper left
    - A condition entry at the upper right
    - An action stub at the lower left
    - An action entry at the lower right.

Condition stub	Condition entry
Action stub	Action entry
Stub	Entry

Figure: a decision table.

- Questions are listed in the **CONDITION STUB**

  It outlines the actions to be taken to meet each condition **ACTION STUB.**

The condition entry part contains the answers to questions asked in the condition stub and the action entry part indicates the appropriate action resulting from the answers to the conditions in the condition entry quadrant.

Condition stub	Condition entry					
	1	2	3	4	5	6
Is the customer a dealer?	Y	Y	N	N	N	N
Is the order size 6PCs or more?	Y	N	N	N	N	N
Is the customer educational institution or individual			Y	Y	Y	Y

Is the order size 50 or more PCs?			Y	N	N	N
Is the order size 20 to 49 PCs?				Y	N	N
Is the order size 6 to 19 PCs?					Y	N

ACTION STUB ENTRY						ACTION
Allow 35% discount	X					
Allow 30% discount			X			
Allow 20% discount				X		
Allow 15% discount					X	

Figure: decision table – an example

4.6. SYSTEM DESIGN (OUTPUT OF SYSTEM ANALYSIS):

System design is another important step in the system development process.

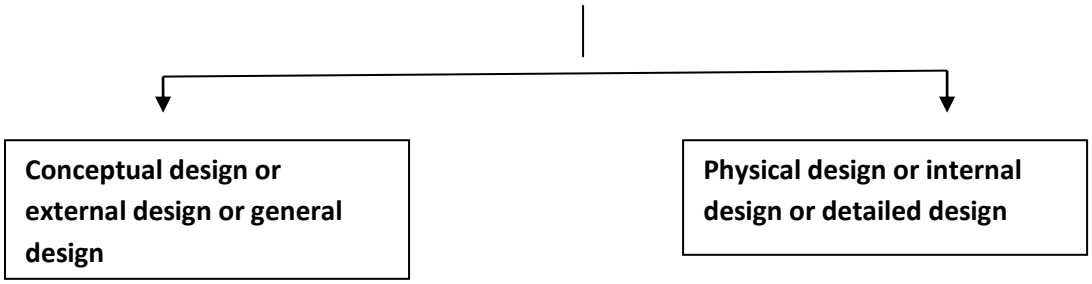
- In other words, the output of the system analysis becomes an input in the design phase.
- For example, for designing a salary system, a system designer would consult the input documents (data sources) such as attendance, leave account, deductions to be made etc.

4.6.1 DESIGN OBJECTIVES

- Practicality
- Flexibility
- Efficiency
- Security

4.6.2LEVELS OF SYSTEM DESIGN:

LEVELS OF SYSTEM DESIGN



1. CONCEPTUAL DESIGN/OVERALL MIS DESIGN/GROSS DESIGN/HIGH LEVEL DESIGN:

It is in the conceptual design stage that alternative overall MIS designs are conceived and the best one is selected by the system analyst in consultation with the top management.

STEPS INVOLVED IN CONCEPTUAL DESIGN

- Define problem
- Set system objectives
- Identify constraints { external constraints / Internal constraints
- Determine information needs
- Determine information sources
- Develop various designs (economics basis, performance basis, operational basis)
- Document the conceptual design (involves overall system flow, system inputs, system outputs)
- Prepare report.

DESIGN METHODS

1.Problem partitioning

2.Structured design

3.Top down design

1. PROBLEM PARTITIONING

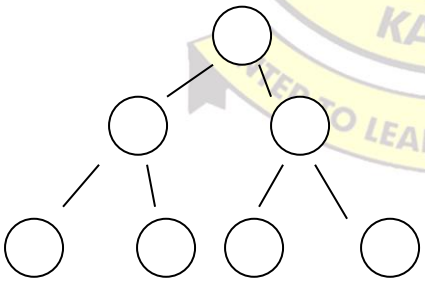
- The method is based on the principle of **divide and conquer**
- Instead of solving the entire problem of once, the problem is divided into small manageable parts (modules) that can be solved separately
- This method reduces complexion, maintenance is minimized.

2. STRUCTURED DESIGN

In this method, a structured chart is created, which can be used to implement the system.

- The aim is to produce a structure where the modules have minimum dependence on each other.
- Various tools like flow-charting, data flow diagrams, structure charts, structured English etc, are used in a structured design

3. TOP DOWN DESIGN



- Top-down design suggests that a system consists of sub systems, which have sub- systems of their own.
- It involves high level components and low-level components.
- It attempts to smoothen the path of system design by starting of the top and designing the broad modules first.

2. DETAILED SYSTEM DESIGN

- The main objective of the detailed system design is to **prepare a blue print of a system that meets the goals of the conceptual system design requirements.**
- **Detailed system design involves the following phases,**
  1. Project planning and control
  2. Involve the user
  3. Define the detailed sub-systems
  4. Input/output design
  5. Feedback from the user
  6. Database design
  7. Procedure design
  8. Design documentation

4.7. IMPLEMENTAION PROCESS

INTRODUCTION

Once the design of MIS is complete it is ready for implementation

- Implementation is a process of **coding, testing, installation, documentation, training and support.**
- Implementation means constructing and putting the new system into operation.

IMPLEMENTATION PROCESS

- Implementation of MIS is a process in itself and involves various steps
- It is understood here that the major steps are based on the design specifications
- All requirements of the system such as input, processing, output, equipment, personnel are provided by the design specifications
- However, the steps are not sequentially exclusive some of the steps overlap

4.7.1 THE VARIOUS STEPS IN IMPLEMENTATION PROCESS ARE AS FOLLOWS,

1. **Planning the implementation**
2. **Acquisition of facilities and space planning**
3. **MIS organization and procedure development**
4. **Acquisition of hardware and software**
5. **Coding**
6. **Testing**
7. **Creation of forms and database**
8. **Documentation**
9. **User training**
10. **Installation**

1. Planning the implementation

- It is obviously that the first step in the implementation of an MIS to plan it.
- It is in this step that various activities which are required for implementing a system are identified and their sequence and relation to each other is decided.
- Time required and cost estimates are also obtained
- To better describe the plan and implementation schedule, a system analyst should make use of various tools like, GANTT CHARTS, NETWORK DIAGRAMS ETC.

2. Acquisition of facilities and space planning:(Office, Computer Room, Computer Library)

- The IS (Information System) to be implemented may be for a new organization, where no old system is in existence.

- For proper implementation of the system the MIS manager is required to prepare **estimates of floor space requirements** and also rough layouts
- Space planning should take into account the space occurred by computers terminals, printers, etc., as also by people and their movement.

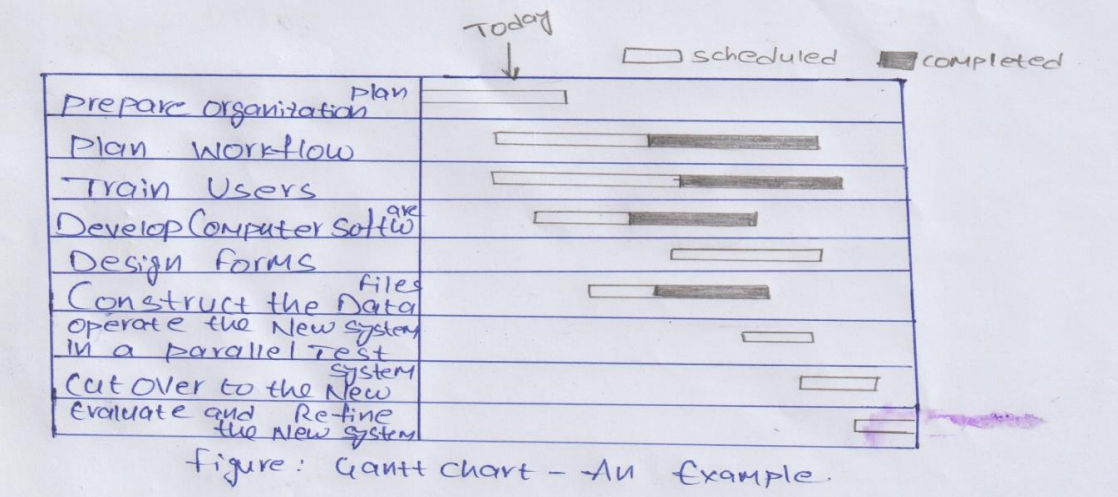


figure: Gantt chart – An Example.

3. MIS organization and procedure development

- It is also important that a manager (finance/accounts/computer centre) be given the responsibility of guiding the task of implementation
- The users should develop a feeling as if the system is their own system
- It is right time here that the manager starts recruiting / hiring other required personnel.
- The procedure development includes evaluating and selecting hardware, buying or developing software, implementation strategies, testing of the system etc.

4. Acquisition of hardware and software

- Start immediately after the design specifications of the system are over.
- It may be quite complex and time consuming
- It should be ensured that the facilities which are required for installing the hardware, such as preparation work, computer room layout, AC, electric

connections, communication lines etc, should be complete to avoid loss of time in making the system operational.

- At this stage ,consumables like ribbons, paper, floppies, tapes, CD, etc, should also be acquired.

5. Coding

- During coding stage, the physical design specifications created by the system designer team are turned into working computer code by the programming team.
- Depending on the size and complexity of the system, coding can be an involved intensive activity

6. Testing:

- Immediately after the coding has started, the testing process can begin and proceed in parallel.
- As each programme module is produced it needs to be tested individually, then as part of a larger program and then as part of a larger system.
- These tests are performed mainly for accuracy, range of inputs, frequency of inputs and operating conditions and reliability etc.
- Testing of IS, now a days can be undertaken with the help of computer Aided Software Engineering (CASE) Tools.

7. Creation of Forms And Data Base:

- Forms are very important for transmitting data.
- They are also required for input to the system and output from the system.

8. Documentation: system documentation

User documentation

SYSTEM DOCUMENTATION: it is intended primarily for maintenance programmers or technical persons, records detailed information about systems design specifications, its internal working and its functionality.

USER DOCUMENTATION: It is intended primarily for users and consists of written or other visual information about an application system, how it works and how to use it.

9. User Training:

- Training is very important for successfully implementing an IS.
- FOR EXAMPLE, clerical or managerial, frequent users versus occasional users.
- The MIS manager must design training programmes as per the needs of the users.
- Clerical users must be trained in the processing of transactions.

10. Installation/Change over:

- it is even of switch-over from the **old system to the new system** which takes place after the system is tested and found reliable.
- The existing system is replaced by the new system in this phase.
- Conversion from the old system to the new system may be accomplished by selecting one or a combination of various conversion approaches.

4.8. PRODUCT BASED MIS EVALUATION:

INTRODUCTION: Evaluation of MIS, is a process of measuring performance of organizational information system. The feedback so obtained helps determine the necessary adjustments to be made in there Information System.

Product Based MIS Evaluation:

- ✓ Since the focus of the product-based evaluation is on the product (information support) or the output from the system, the evaluation may be termed as effectiveness evaluation.
- ✓ For assessing the effectiveness of output from MIS, the following model may be used.

4.8.1 MODEL STRUCTURE:

- ✓ The information attributes may be identified as components of a general model for evaluation of MIS effectiveness in an organization.
- ✓ Some of these attributes are listed below,

1. Timeliness
2. Relevance
3. Accuracy
4. Completeness
5. Adequacy
6. Explicitness
7. Exception based

4.8.2MODEL IMPLEMENTATION

- ✓ Various types of outputs/reports, being generated by MIS of the organization can be evaluated for their effectiveness in terms of the attributes of the management information.
- ✓ To employ this model, managers at different levels of management of the organization may be asked to rate the outputs/reports on each of the information attributes.
- ✓ To get responses, a five-point scale may be used on which the users of Information System may be asked to rate the effectiveness of MIS in terms of these information attributes.
- ✓ For example: A five-point scale may be prepared to get an evaluation of the no. of reports received by the managers in terms of 'timeliness' as given below,

All reports	most reports	many reports	some reports	no reports
4	3	2	1	0

- ✓ The scale thus prepared is to be administered either through a mailed questionnaire or through personal interview and the scoring may be done by

assigning a numerical value of 0 to least favorable location on the scale 1 to the next favorable and soon.

$$\text{ES MIS} = \sum_{K=t}^{10} E.SK/n$$

Where ESK = Effectiveness score for K^{th} attribute.

S = score assigned to the response

F = frequency of the score

N = number of respondents.

EFFECTIVENESS NORM

Now ideally speaking, ES MIS should be equal to 4.

- ✓ However owing to the high cost involved in such a system and uncertain environment, such a situation is not practical.
- ✓ Therefore, a tolerance limit is to be prescribed which serves as a standard norm, against which the organization may compare the effectiveness of the existing MIS to determine deviations, if any.
- ✓ It is on the basis of this comparison that an MIS maybe termed as either effective or otherwise.
- ✓ The tolerance limit for defective reports may be decided by the organizations concerned; it may vary from 5 to 20% and accordingly ,the standards for an effective MIS may be computer in terms of its ESMIS as follows,
- ✓ On the fire point scale, the total scale is divided into four parts.
- ✓ Taking total scale = 100, each part = 25.
- ✓ Thus, on this scale 100%, 75%, 50%, 25% and of 0% of the reports are represented by a score of 4, 3,2,1,0.
- ✓ According to this rule 11% of the reports would be represented by $1/25^{th}$ (0.04) part on the scale.
- ✓ For 90% of output is 0.04 * 90 = 3.6 on the scale.

✓ Therefore, 90% of the outputs will be represented on the scale by an effectiveness score of 3.6

4.9. COST/BENEFIT-BASED EVALUATION:

In cost/benefit evaluation, a thorough study of various expected costs, the benefits to be expected from the system and expected savings, if any, is done. It is an economic evaluation of the system, in which costs to be incurred for developing, implementing and operating a system are to be justified against the expected benefits from the system.

In other words, cost/benefit analysis determines the cost-effectiveness of the system.

- **Expected cost elements** – initial development costs, capital costs, operating costs.
- **Expected benefits** – reduced cost, better performance/decisions

A brief description of all these cost elements and benefits is given below,

1. **Initial development cost**
2. **Capital cost**
3. **Annual operating cost**
4. **Identification of costs and benefits**
5. **Classification of costs and benefits**

1. **INITIAL DEVELOPMENT COST:** Initial development cost is the cost incurred in developing an information system. Various elements of development cost include project planning cost, feasibility study cost, design cost, conversion cost, implementation cost (including user training cost, testing costs, etc.).In other words ,total development cost is considered one-time cost and is termed as initial development cost.
2. **CAPITAL COST:** It is also one-time cost.
   - It is the cost incurred in facilities and in procuring various equipment, including hardware etc, required for the operation of the system

- Facility costs (wiring, flooring, lighting, AC cost), space required for office, storage computer room, hardware equipment cost.

3. ANNUAL OPERATING COST:

- Annual operating cost is the cost incurred in operating the system.

a. AMC (ANNUAL MAINTENANCE COST)

- (In includes computer and equipment maintenance cost, personnel cost, overheads and supplies cost.)

b. PERSONNEL COST

(Includes staff salary, PF, health insurance, pensionary benefits)

c. OVERHEAD COST

(Include all costs associated with the day-to-day operations of the system)

d. SUPPLY COST

Supply cost are variable costs that increase with increased use of paper ribbons, disks etc.,

Various benefits → Improving performance

Various benefits → Minimizing the cost of processing

For identification and categorization of various costs and benefits the following concepts are importance,

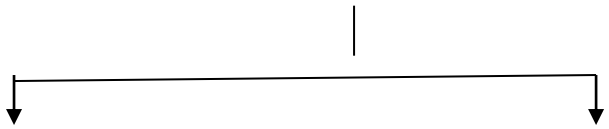
4. IDENTIFICATION OF COSTS AND BENEFITS:

DIRECT COST: (Price of PC, ribbon etc,) Easily identified from invoices or records

DIRECT BENEFITS: reduction of staff because of the new system/fast processing etc.,

5. CLASSIFICATION OF COSTS AND BENEFITS:

COSTS



Tangible	**Intangible**
Direct	**Indirect**
Fixed	**Variable**

TANGIBLE COST: costs can be identified and measured.

Example: computer cost, consultancy fee.

INTANGIBLE COST: whose monetary value cannot be accurately measured.

Example: lowered employee morale because of a new system is an intangible cost.

DIRECT COSTS: Direct Costs are those with which an amount in rupees can be directly associated to any of the items or operations of the system

EXAMPLE: the purchase of a computer ribbon for 3500/-

INDIRECT COSTS: Indirect costs are the results of operations that are not directly associated with the system

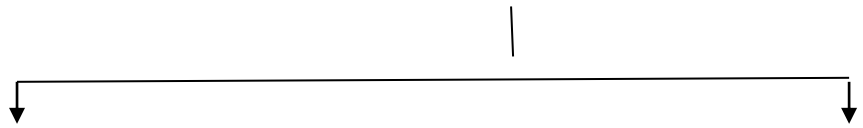
EXAMPLE: safety and security of computer room, electricity, AC and maintenance etc.

FIXED COST: Fixed Costs are constant costs and do not change regardless of how well system is used.

EXAMPLE: capital, Development cost.

VARIABLE COST: Variable Costs are incurred on regular basis.

BENEFITS



Tangible	**Intangible**
Direct	**Indirect**
Fixed	**variable**

TANGIBLE BENEFITS: Reduced salaries producing, Reports with no errors.

INTANGIBLE BENEFITS: High morale among employees, Improved Organizational image .

DIRECT BENEFITS: for example 5% reduction in salary expenditure.

INDIRECT BENEFITS: Indirect Benefits are realized as by-product of some other activity or system

FOR EXAMPLE: Newly computerized salary system

FIXED BENEFITS: Fixed Benefits are also constant and do not change.

FOR EXAMPLE: 10% reduction in staff.

VARIABLE BENEFITS: Variable Benefits are realized on a regular basis.

FOR EXAMPLE: Amount of daily time saved of a manager varies with the number of types of decisions taken.

The MIS evaluation table summarizes the benefits to be expected from the system and the expected costs and expected savings, if any for the MIS user

4.10. PROCESS BASED CALCULATION/EVALUATION:

Process-based evaluation focuses at the effectiveness of the processes (sub processes) that make it. The IS sub-processes are plan process; development process; and use process. These sub processes as the contributors to IS effectiveness, are shown in figure 1 and the detailed view is given in figure 2

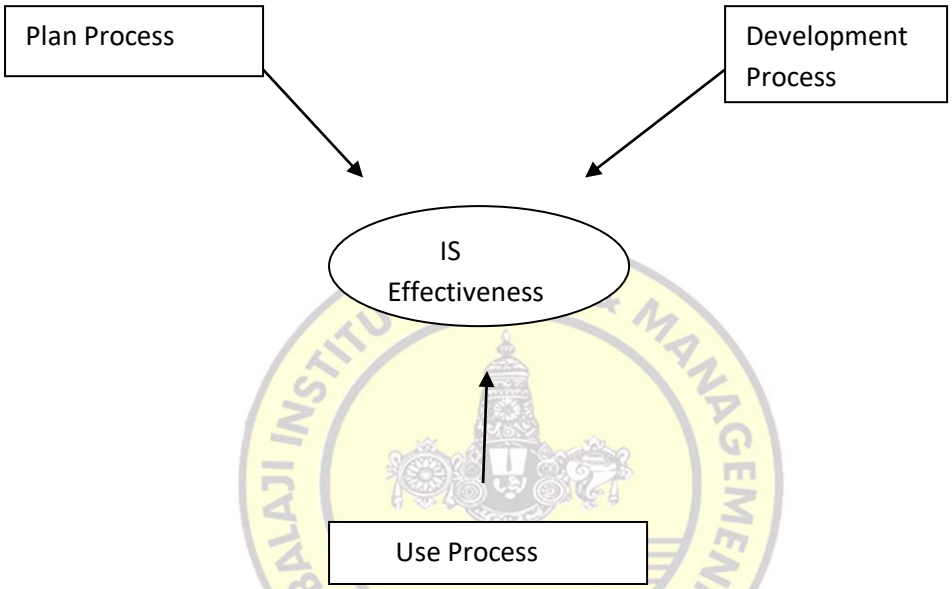
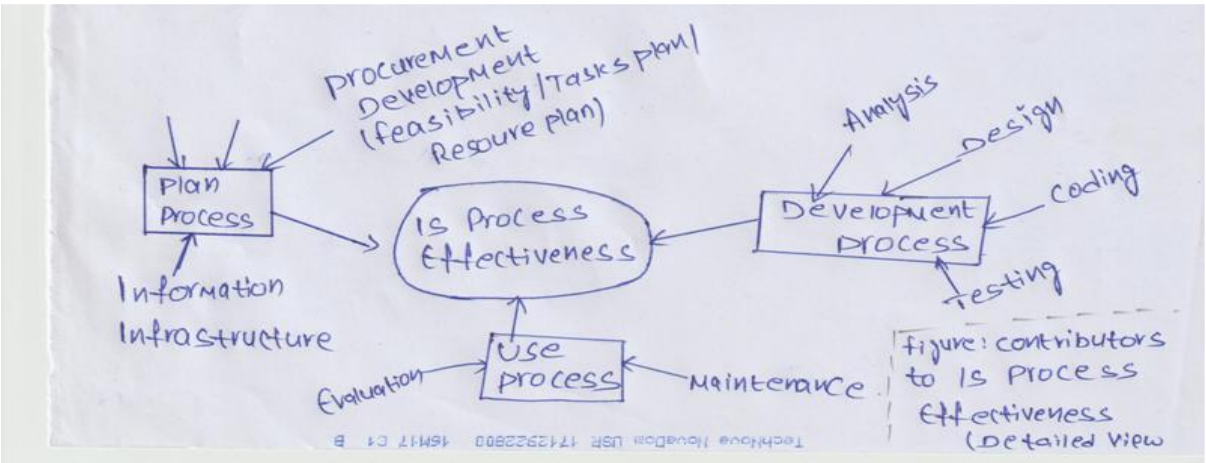


Figure: 1 Contributor to IS Process Effectiveness

As per this model,for effectiveness of IS ,the efforts must begin at the planning stage.To achieve this effectiveness, all the contributors of IS must be well in place,i.e.their effectiveness should contribute to the overall IS effectiveness.



4.11.SYSTEM MAINTENANCE

The results obtained from the evaluation process help the organization to determine whether its information systems are effective and efficient or otherwise. As the organizations exist in dynamic and competitive environments, evaluation is a continuing activity. On the basis of the feedback provided by the evaluation process the organization in order to keep its MIS at the highest levels of effectiveness and efficiency, of course, within cost constraints, must respond by taking corrective actions. Corrective action may include removing errors which may be due to design, due to environmental changes or due to organizational changes, or due to changes while enhancing the existing system. This process of monitoring evaluating and modifying of existing information systems to make required or desirable improvements may be termed as **system maintenance.**

System maintenance is an ongoing activity ,which covers a wide variety of activities including removing program and design errors ,updating documentation and test data and updating user support. For the purpose of convenience, maintenance may be categorized into three classes, namely;

(i) Corrective

(ii) Adaptive and

(iii) Perfective

1. CORRECTIVE MAINTENANCE

This type of maintenance implies removing errors in a program which might have crept in the system due to faulty design or wrong assumptions. Thus, in corrective maintenance, processing or performance failures are repaired.

2. ADAPTIVE MAINTENANCE

In adaptive maintenance program functions are charged to enable the information system to satisfy the information needs of the users. This type of maintenance may become necessary because of organizational changes which may include,

(i) Change in the organizational procedures

(ii) Change in organizational objectives goals, policies etc,

(iii) Change in forms

(iv) Change in information needs of managers

(v) Change in system controls and security needs etc.

3. PERFECTIVE MAINTENANCE

Perfective maintenance means adding new programs or modifying the existing programs to enhance the performance of the information system. This type of maintenance is undertaken to respond to the user's additional needs which may be due to the changes within or outside of the organization. Outside changes are primarily environmental changes, which may in the absence of system maintenance, rendering the information system ineffective and inefficient. These environmental changes include,

(i) Changes in government policies laws etc.

(ii) Economic and competitive conditions and

(iii) New technology

No doubt, maintenance is regarded as necessary evil but is should not be delegated to junior programmers; nor should it be performed on a haphazard or informal basis; rather maintenance must be given its due status in the organization and should be,as far as possible, properly planned and the maintenance responsibility should be entrusted to a qualified supervisor and team of MIS experts.

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BALAJI INSTITUTE OF IT & MANAGEMENT

Icet Code: BIMK

SUBJECT: MANAGEMENT INFORMATION SYSTEM (MIS)

Regulation: R17

UNIT-4

PREVIOUS YEAR QUESTIONS

1. (a)What is the need to link information systems plan to overall business plan and how it is done?

(b)Illustrate various system development models.

OR

2. (a)Explain the procedure of product based MIS evaluation.

(b)Distinguish between systems analysis and systems design.(January 2020 regular & supply)

3. (a)Define information requirements and explain why they are important for developing a system solution.

(b)Define the traditional systems development life cycle (SDLC) and describe its advantages and disadvantages for systems building.

OR

4. (a)Describe how cost-benefit analysis can be used to establish the worth of systems.

(b)Define the user-designer communications gap and explain the kinds of implementation problems it creates.(October 2020 supply)

5. How the software engineering qualities can be assured in real life?

OR

6. Define project. Explain the different types of project. (dec/jan 2018/19 reg & supply)

7. Discuss about system development models?

OR

8. Explain the steps in cost/benefit based evaluation? (dec/jan 2017/18 regular)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
(Established by Govt. of A.P., ACT No.30 of 2008)
ANANTHAPURAMU – 515 002 (A.P) INDIA

MASTER OF BUSINESS ADMINISTRATION
MBA; MBA (General Management); MBA (Business Management)
COMMON COURSE STRUCTURE

Course Code	MANAGEMENT INFORMATION SYSTEMS	L	T	P	C
21E00106		4	0	0	4
	Semester	**I**			

Course Objectives:

- To provide the basic concepts of data and Management Information System and utility of the MIS for the managerial decisions.
- To Explain Management of Information system, MIS design and implementation process in an organisation.
- To discuss security, ethical and social issues in management of Information system.

Course Outcomes (CO): Student will be able to

- Know Management of Information system scope, application and challenges in managing MIS.
- Understand traditional and modern approaches for data resource management and models.
- Evaluate product based and process based cost and benefit to implement and maintain MIS in an organization.

UNIT - I	Lecture Hrs: 8

MIS An overview- Introduction, Need for MIS and IT nature and scope of MIS, MIS characteristics, Structure of MIS, role of MIS in global business. Challenges of Managing MIS.

UNIT - II	Lecture Hrs: 12

Data resource management- Data base concepts, The traditional approaches, the modern approaches (Data base management approaches) DBMS, Data models, Data ware housing and mining.

UNIT - III	Lecture Hrs:12

Business application of IS- Enterprise systems, ERP, CRM, SCM, DSS, Types of decisions, Decision support techniques, Decision making and Role of MIS, Business intelligence and Knowledge management systems.

UNIT - IV	Lecture Hrs:12

Management of IS- Project planning, SDLC, System development models, Project management, system analysis, system design, Implementation process, Product based MIS evaluation, Cost /Benefit based evaluation, Process based calculation, System maintenance

UNIT - V	Lecture Hrs:12

Security, Ethical &Social Issues : IS security threats, Protecting IS,IS Security Technologies, The disaster recovery plan, IS Ethical Issues, social issues.

Textbooks:

1. MIS –Managerial Perspective, D.P.Goyal,Vikas Publications.
2. Management Information Systems Text & Cases, W S Jawadekar, Tata McGraw-Hill.

Reference Books:

1. Management Information Systems, C Laudon and Jane P.Laudon, et al, Pearson Education.
2. MIS, Hossein Bidgoli, Nilanjan Chattopadhyay, Cengage Learning
3. Introduction to Information Systems, Rainer, Turban, Potter, WILEY-India.
4. Management Information Systems, James A. Obrein, Tata McGraw-Hill .
5. Cases in MIS, Mahapartra,PHI.
6. Management Information Systems, Gordon B. Davis & Margrethe H.Olson, Tata McGraw-Hill .

Online Learning Resources:

https://onlinecourses.nptel.ac.in/noc20_mg60/preview
https://nptel.ac.in/courses/110/105/110105148/
https://onlinecourses.swayam2.ac.in/cec21_ge05/preview

UNIT-5

SECURITY, ETHICAL AND SOCIAL ISSUES

INTRODUCTION

- IS security is not a new concept. It started from the day; the first mainframe computer was developed.
- With the advances in telecommunication systems, organizations have started using more and more networked systems.
- Because of the networked systems, ISs have become easy targets of threat as the internet has thousands of unsecured computer networks which are in communication with each other.

Thus, now a days IS security has assumed all the more significance than ever before.

- Today, organizations need to understand the potential threats/risks to their ISs and just have well defined strategies to manage those risks.
- Further, the managers need to take an important decision regarding the adequate level of safety and security for their IS.

5.1 IS SECURITY THREATS

Some of the stems (IS) are categorized as follow,

1. Human errors or failures
2. Manipulation of data/systems
3. Theft of data/system
4. Destruction from virus
5. Technical failure/errors of systems
6. Natural disasters such as flood, fire, earthquake, etc

1. HUMAN ERRORS/FAILURES

- ✓ This category includes unintentional errors made by an authorized user.
- ✓ The employees of the organization may commit errors such as,
  - ➢ Entry of wrong data
  - ➢ Accidental deflection
  - ➢ Modification of data
  - ➢ Storage of data in unprotected areas such as desktop, website.
- ✓ These types of errors/failures of ISs may happen because of **lack of experience/ improper training.**

2. MANIPULATION OF DATA/SYSTEMS

- ✓ These happens because of the deliberate acts of some persons/the organizations designed to harm the data/IS of an organizations
- ✓ In this type of threat**, an unauthorized individual** gains an access to the private/important data of an organization and purposefully do some wrong acts like delete, corrupt /steal the data.

3. THEFT OF DATA/SYSTEM

Though thieves may steal physical items such as entire computer, circuit boards and memory chips, the theft of electronic data pose a greater challenge.

HACKING: The act of breaking into computer or computer networks illegally is known as hacking/cracking.

IDENTITY THEFT/PHISHING: It is done with fake websites that look as genuine ones.

Example: Ms sunitha receives an email from her bank, asking for upgrading the login and password details for security reasons and asks her to click the link, and then taken to a website looks similar to her banks website, when she enters her login ID and password, she is not able to enter the page and only gets an error message. Thus Ms sunitha was directed to a fake website where login ID and password was taken by somebody.

4. DESTRUCTION FROM VIRUS

- ✓ This category of threat is the potential for deliberate (done intentionally) software attack. This kind of attack happens when a person or a group write software to attack data or IS of an organization with the purpose of damage, destroy or deny services to the target systems.
- ✓ Malicious code/software/malware: The program, which is written with an intent to attack data or IS.

Example of malware,

- ✓ Viruses and worms
- ✓ Trojan horses (illegal programs, contained within another program)
- ✓ Logic bombs/time bomb.

5. TECHNICAL FAILURE/ERRORS OF SYSTEMS

It occurs because of the manufacturing defects in the hardware or the hidden faults in the software.

6. NATURAL DISASTERS

- ✓ Sometimes the threat may not be because of unintentional acts of an individual/group of persons, rather it may be from the acts of God that result from forces of nature that cannot be prevented / controlled.
- ✓ Such threats include **fire, flood, earthquake, lightening.**

In view of above mentioned threats, organizations need to implement controls so as to avoid, reduce and manage risk from these threats.

5.2 PROTECTING INFORMATION SYSTEM

- ❖ Avoiding, reducing IS threats is one of the challenging tasks for any IS manager.
- ❖ To do so, organizations need to formulate the right protection strategies and implement appropriate controls.

❖ These strategies and controls are intended to prevent accidental hazards, detect problems and improve damage recovery problems.

5.2.1 IS PROTECTION STRATEGIES

Figure: IS PROTECTION STRATEGIES

1. **PREVENTIVE STRATEGY**

   It refers to the controls that would help prevent errors from occurring, deter criminals and deny access to unauthorized people.

2. **DETECTION STRATEGY**

   Organization should use special diagnostic software that may detect the potential threats.

3. **MINIMUM LOSSESS STRATEGY**

   - It refers to minimize losses once a threat has happened.
   - Users should get their systems back in operation as early as possible.

4. **RECOVERY STRATEGY**

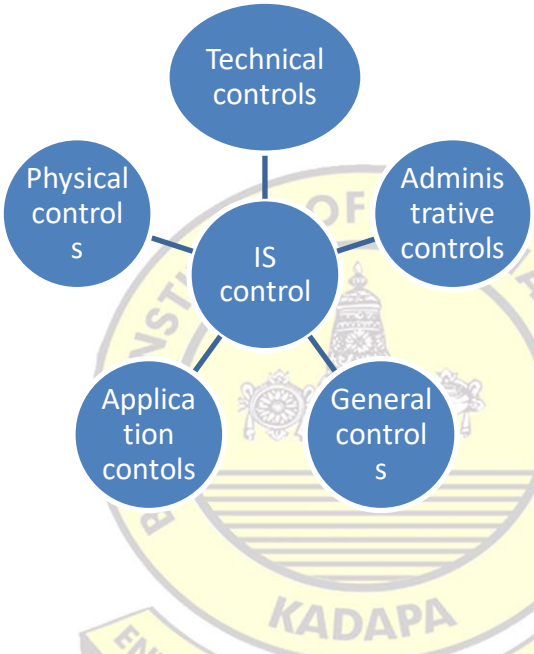
   A recovery plan, that explains how to fix a damaged information system as quickly as possible must be in place. Replacing rather than repairing components is one way to fast recovery.

5. **CORRECTIVE ACTION STRATEGY**

The damaged system must be corrected immediately so as prevent the problem from occurring again.

5.2.2 IS CONTROLS

- The organization can plan and implement various kinds of IS controls so as to avoid, reduce and manage the risks to the potential threats to IS.
- These controls can be understood under the following five categories.



1. PHYSICAL CONTROLS

- These controls refer to the protection of computer facilities and other IS resources.
- This includes protecting computer hardware, computer software, data base, computer networks etc.
- Physical security of the IS resources include various controls such as,the site should have proper AC, adequate drainage facilities and emergency power shutoff and backup systems.

2. TECHNICAL CONTROLS

- The technical controls are the controls which are implemented in the application of IS itself.

- These type of controls include,
  a. Access controls
  b. Data security controls
  c. Communication controls

A. ACCESS CONTROLS

- These controls refer to the restrictions imposed for the unauthorized access of any user to IS resource.
- The identification of the user can be obtained through a unique user identifier such as the password a smart card, digital signature, voice, finger print, eye scan etc.
- Unique user identifier is normally implemented through bio-metric controls.

B. DATA SECURITY CONTROLS

- To protect data from accidental disclosure to unauthorized person, data security controls are very useful, which can be implemented through operating system
  (OS), database security, access control programs, backup and recovery procedures etc.

C. COMMUNICATION CONTROLS

- With an increased use of the internet ,intranet and electronic commerce, communication controls have become all the more important.
- Various communication controls include,
  - Access control
  - Data encryption
  - Fire wells

3. ADMINISTRATIVE CONTROLS

It includes clear guidelines, policies of the organizations with regards to the use and deployment of IS resources are very important in protecting IS.

For Example, email policy, internet use policy, programming and documentation standards.

4. GENERAL CONTROLS

These control are implemented so as to ensure that ISs are protected from various potential threats

For example, system development controls such as budgeting schedule, quality etc.

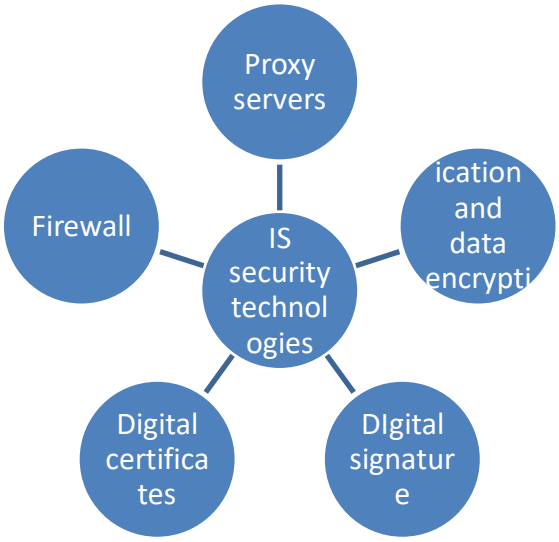
5. APPLICATION CONTROLS

- These controls are usually written as validation rules.
- These controls are popular known as input controls, processing controls, output controls.

5.3 IS SECURITY TECHNOLOGIES

In order to protect the IS resources, organizations implement a number of technical solutions as**" security measures."**

Some of the technical solutions may include



1. FIRE WALL

- ✓ A firewall is a system designed to prevent unauthorized access to or from a private network.
- ✓ Firewall can be implemented either hardware, or software or both that acts as gatekeeper and protects IS.
- ✓ Firewalls prevent unauthorized internet users from accessing private networks connected to the internet.
- ✓ Acts like watchman, will not allow any unauthorized user to access the server of an organization.

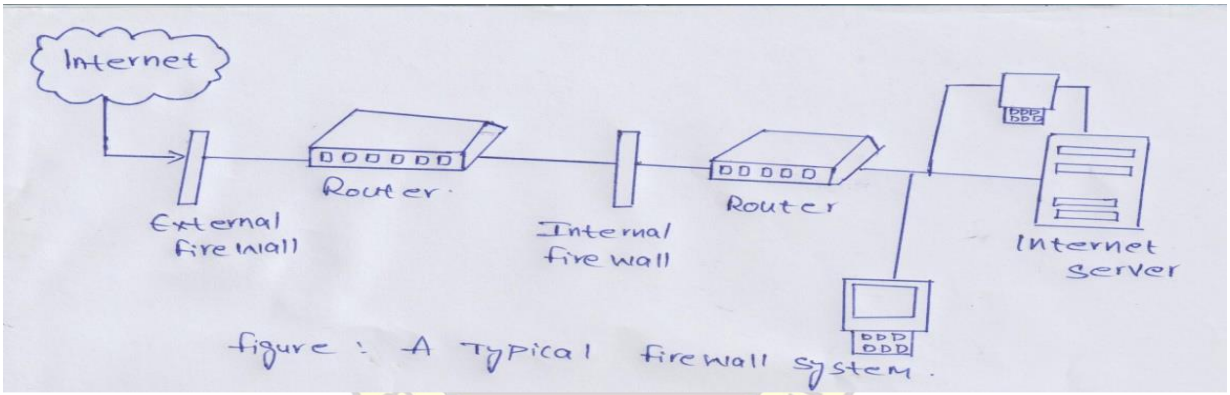


figure : A Typical firewall system.

2. PROXY SERVERS

- ✓ It acts as a representative of the true server of an organization
- ✓ A proxy server is configured to look like a web server with the domain name of the true server of the organization.
- ✓ When any person from outside requests a particular webpage, the proxy server receiver from the true server.
- ✓ Thus the person gets the information without getting in direct contact with the true web server.
- ✓ When business hires the services often ISP (internet service provider) the proxy server is often the one operated by the ISP.
- ✓ Both the organization network server and proxy serve employ firewalls.

3. AUTHENTICATION AND DATA ENCRYPTION

- ✓ Authentication is the validation of a users identify.

- ✓ For the authorized access, a user is given a password or PIN.
- ✓ The password is known only to the authorized person.
- ✓ ID cards, ATM cards, smart cards are the other access control measures, through which the users identify is proved.
- ✓ Bio-metric access control (trending one)
- ✓ Authentication can be accomplished by senders and receivers exchanging codes known only to them.

ENCRYPTION:

- ✓ Coding a message into a form unreadable to an interceptor is called encryption.
- ✓ It uses mathematical algorithm to jumble information (coded) to be transmitted over the internet and then to decode the data offer it is received.
- ✓ The widely used encryption method uses a pair of public and private keys unique to each person.

For Example, a message which is to be set, could be encoded using a unique public key for the recipient that is known to the **sender**.

After the message is transmitted, only the recipient's private key could decode the message.

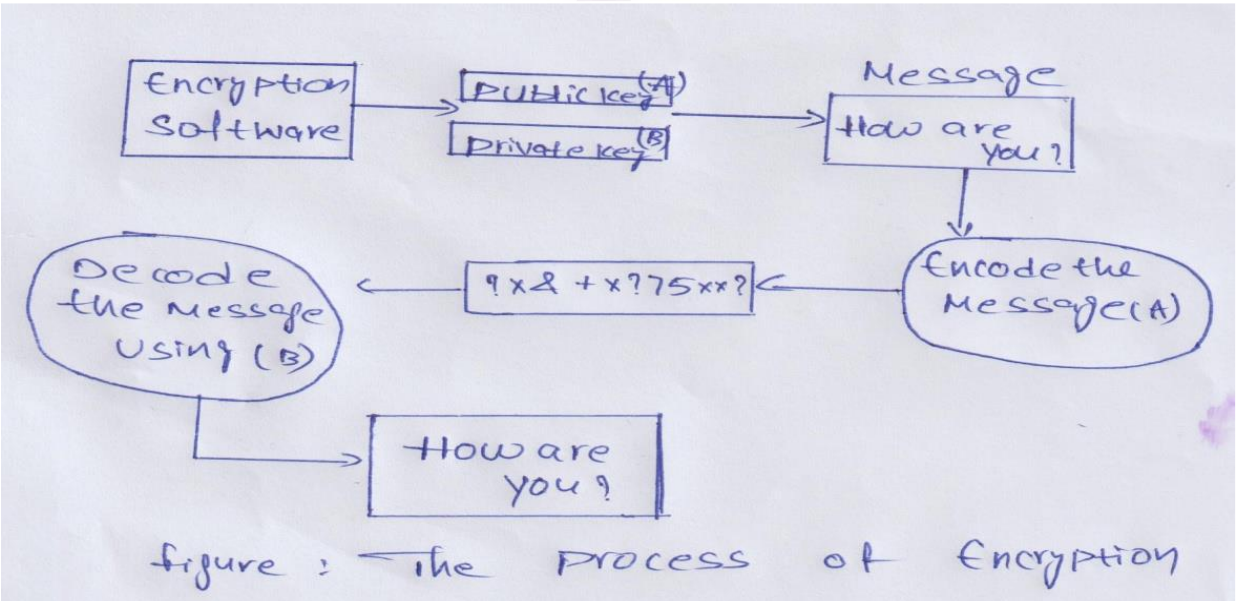
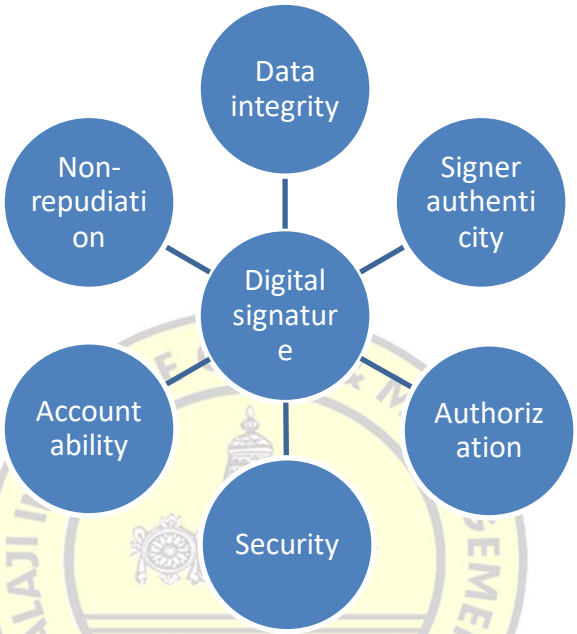


figure : The process of Encryption

4. DIGITAL SIGNATURES

A digital code (generated and authenticated by public key encryption) which is attached to an electronically transmitted document to verify its contents and the sender's identity.



- ✓ A digital signature, which is implemented with public-key cryptology, is created in two phases.
- ✓ First, the cryption programme uses a mathematical algorithm to create a message digest for the message to be transmitted.
- ✓ A message digest is similar to the unique finger print of a message.
- ✓ Then, the software uses the private key to encrypt the message digest.
- ✓ This results into digital signature for that specific message.

5. DIGITAL CERTIFICATES

- ✓ It is like a digital signature which is used to authenticate the sender as well as content.
- ✓ Digital certificates are issued by organization which is then called a certificate authority.

- ✓ The information such as senders name, serial numbers expiration date and a copy of the certificate holder's public key along with the digital signature of the certificate authority are stored on the digital certificate.
- ✓ There are many companies that sell digital certificates, for example American Express certificate authority, Digital Signature trust co, version inc, global sign NV, etc.

5.4. THE DISASTER RECOVERY PLAN

- As it is difficult or may be very expensive to avoid or control all disasters organizations must be ready to reduce the risk from the potential threats and manage on its own if some disaster happens.
- In order to minimize the business loss it is important that is services must be brought back to order or resumed as early as possible.
- Thus it becomes important for the organizations that they need to have disaster recovery plan in place.

5.4.1 THE DISASTER RECOVERY PLAN

- As it is difficult or may be very expensive to avoid or control all disasters, Organizations must be ready to reduce the risk from the potential threats and manage on its own if some disaster happen.
- In order to minimize the business loss, it is important that Information Systems (IS) services must be brought back to order or resumed as early as possible.
- Thus, it becomes important for the organizations that they need to have disaster recovery plan in place.

DISASTER RECOVERY PLAN: It is a well-documented programme that provides detailed guidance and procedures to execute during and after a disaster.

It also lists the roles and responsibilities of the person involved in recovery ,if IS resources go down.

5.4.2 STEPS INVOLVED IN DISASTER RECOVERY PLAN

STEP-1-Commitment of the top management

STEP-2-Sensitisation of all the employees

SPTE-3-Appointment of business recovery coordinator

SPEP-4-Establishment of priorities

STEP-5-Selection of a recovery plan

SPETP-6-Execution of the selected plan

STEP-7-Review and updating of the disaster recovery plan.

STEP-1

- For the success of any disaster recovery plan,it is important that there is a strong commitment of top management.
- The plan requires a substantial amount of resources which must be properly budgeted and provided by the top management.

STEP-2

- IS security is not the sole responsibility of any one person rather it is the responsibility of the whole organization.
- Thus all the employees of an organization must be sensitized regarding the concept of IS security and their overall responsibility.

STEP-3

- There should be a team of persons drawn from all the departments of the organization, along with a coordinator, who should be responsible for the disaster recovery.
- The roles and responsibilities of the members and the coordinator should be clearly established.

STEP-4

- The committee should identify all the risks and then prioritize these risks so as to handle them as per their impact on the business.
- For example, the applications without which the business cannot conduct operations, should be given the highest priority and soon.

STEP-5

- The commitment should find out various recovery plan alternatives, which are evaluated by considering advantages and disadvantages in terms of risk reduction cost and the time required for an organization to adjust to the alternative system.
- On the basis of evaluation the recovery plan is finalized and selected.

STEP-6

Immediately after the recovery plan is selected it must be executed as the top most priority

STEP-7

The plan must be reviewed after a regular interval to consider the changing requirements so as to update the plan.

5.5. IS ETHICAL ISSUES

- Ethics may be understood as the principles of right and wrong that individual or society choose to guide their behaviors.
- Ethics may be referred as publicly accepted norms of behavior for social engagement.
- Ethics may differ from one society to that of another society.
- Ethics should not be confused with the term legal (law).
- Any legal issue is decided by the system of justice of the country Where as ethics are not written down.

- The following ethical issues are of concern these days, which have been portrayed in figure,

1. **Private data**
2. **Workplace monitoring**
3. **Power of IS professionals over other users.**
4. **Internet Challenges to privacy**

1. PRIVATE DATA/PERSONAL DATA

- The IS are gathering huge data that may pertain to the employees, customers suppliers or any other stake holder.
- This data may be very personal to those people.
- For example,
    a. The hospital IS keep a record of the details of the diseases and the treatments of their patients.
    b. E-commerce sites capture personal details of a customer.
    c. E-governance sits such as Income Tax department, passport department etc, capture personal details of its citizens.
    d. HR IS collects a lot of personal and details of its employees.
- **The ethical issue regarding the private data** is whether this data relates to the person or to the concerned organization and thus whether the organization can use private data related to a person for its decision making/profit making.
- The answer to this relevant ethical issue varies from country to country.

It is important that the organizations as well the concerned governments of the respective country should have clear policies /laws in place so that the personal data may not be misused by the organization.

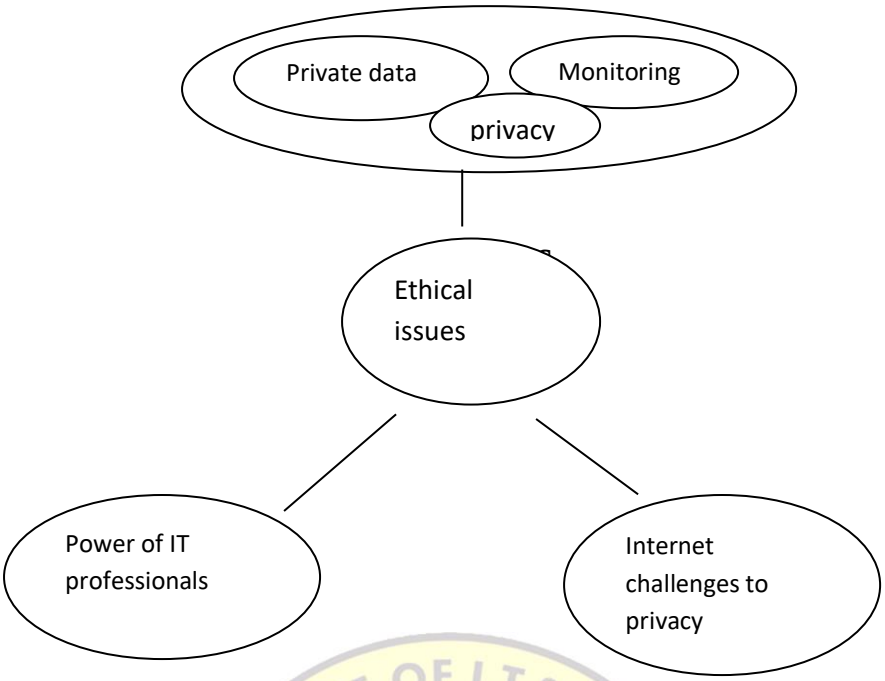


FIGURE: ETHICAL ISSUES OF INFORMATION SYSTEMS

2. WORKPLACE MONITORING

- Monitoring at the work place has been an established method of controlling the performance and the behaviour of the employees.
- The management of an organization argues that the employees are required to have a close watch and supervision so as to ensure the desired behavior from their employees that would in turn help to achieve the targets of the organizations.
    - However, the other school of thought on the workplace monitoring opines that close supervision leads to a loss of privacy and confidence of the employees.
- The increased use of IS has increased the scale and precision of monitoring of employees in the organization.

FOR EXAMPLE, the BPO companies digitally record and store the conversations of their employees to analyze whether the call was answered as per the prescribed norms.

However internet technology has posed new challenges for the workplace monitoring that has led to the loss of individual privacy.

THE FOLLOWING EXAMPLES ILLUSTRATE THE PRIVACY ISSUE

1. Some companies monitor employee e-mails and web surfing activities to minimize to wastage of their productive time during office time.

2. The movement of the employees is captured from the security systems that use swipe cards for opening the office doors.

3. The time spent by the employees may also be monitored from the log of the computer.

3. INTERNET CHALLENGES TO PRIVACY

Cookies pose a great threat to the privacy of the users by using **cookie technology**, the websites can also capture data about the visitors without their knowledge's.

- Cookies are small files that are stored on a computer hard drive when a user surf the websites.
- For example, e-commerce (that the customer details)

4. POWER OF IS PROFESSIONALS OVER OTHER USERS

- IS are developed and managed by IS professional with technical knowledge and the users do not have this technical knowledge.
- It has been observed that IT professionals many a times influence the thinking of the other users and make them to listen to and agree to what they say.
- This is known as exercising the power of IS professionals over users.
- In still another situation, where the user is not aware of the power exercise, this would result into manipulation by the IT professional.
- However, if the user is aware and the IS professional is not aware of such a situation, then it may lead to the resistance of the user.

The ethical issues arise in situations where either party is unaware of the power exercise.

- Organizations should sensitize all the users as well as the IT professionals in the organizations. So that no one feels that they are being dominated by the other party.

5.6 SOCIAL ISSUES

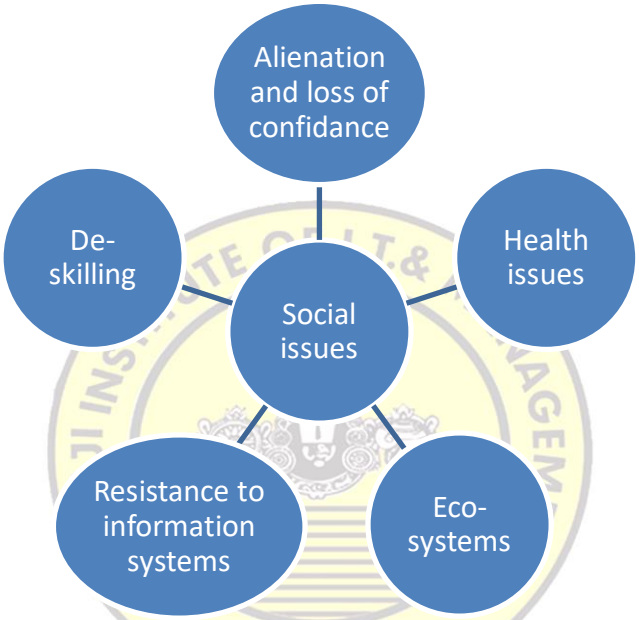


FIGURE: SOCIAL ISSUES OF INFORMATION SYSTEMS

- Information systems impact the individuals and the society in a number of ways.
- IS ,despite many benefits can damage our culture and society in a big way.
- Some of the negative social consequences of these IS are discussed as below as shown

1.De-skilling

2.Alienation and loss of confidance

3.Resistance to ISs

4.Health Risks

5.IT eco-system

1. DE-SKILLING

- ✓ With the new information systems in place the employees may be required to forget or unlearn some of the skills that were required to work with the manual or the old systems.
- ✓ This process of losing the skills because of the new systems is referred to de-skilling.

FOR EXAMPLE

- ✓ With the dependency of the children on the computer systems, their ability to calculate numbers is decreasing.
- ✓ Similarly, the employees who used to work with the new computerized IS, does not use their memory even for small things.

In order to develop the skills which are necessary for the overall development of the users, there should be more focus on improving the analytical and aptitude skills and thus more programmes need to be organized where the employees find challenges in solving problems requiring mental and logical abilities.

2. ALIENATION AND LOSS OF CONFIDENCE

- ✓ As the people start doing more tasks using IS, they may not be doing tasks that require meetings and discussions with people.
- ✓ Slowly, their interactions with the colleague's would decrease.
- ✓ Even it may lead to spending of their lesser time with the family member's, friends etc.
- ✓ It results alienation among individuals IS and the lack of socialization may lead to loss of confidence among the individuals.

So in order to overcome this problem organizations should develop more programs or organize social events so as to increase the interaction among the employees.

3. HEALTH ISSUES/HEALTH RISK

- ✓ Working with IS for long hours leads to several health issues. Like **back pain, eye strain, posture problems, wrist injuries, mental stress.**
- ✓ So in order to overcome these problems organizations should design the equipment and the supporting furniture, so as to take care of the convenience and comfort of the users.
- ✓ Wellness programmes can also help taking care of the employee's health.

4. IT ECO-SYSTEM (ENVIRONMENT)

- ✓ The information technology ecosystem **comprises hardware, software, computer-embedded machines, networking equipment.**
- ✓ For developing and using of these IS, many human activities such as **Research and design, production, assembly, packaging, transportation, retailing** are required to be executed.
- ✓ The end users also engage in activities such as **using, buying, and eventual disposition of IT components.**
- ✓ Refresh cycle for IT equipment is relatively short, At the same time the users want to constantly update their equipment with newer, fancier once even though the older equipment is often still working (example, smart phone, laptop etc.)
- ✓ All new above problems create environmental problems and thus are significantly affecting the natural ecosystem of this planet.

The disposal of all the unneeded electronic devices, which contain a lot of toxic substances, creates huge problem due to toxic chemicals contained in its hardware.

So to overcome this problem, the manufacturing companies need to focus on developing efficient technology products, keep e-waste out of landfills and adopt recycle and reuse programmes.

- ✓ Awareness programs (helpful tips on how to serve energy)

- ✓ A social movement is needed to encourage all organizations and individuals for judicious use of IT products.
- ✓ People should be awarded that any unnecessary use of IT products causes energy waste, environmental pollution and depletion of natural resources and emission of CO_2

5. RESISTANCE TO IS

- ✓ Generally ,it is found that whenever an organization wants to implement a new IS, it is resisted by the users.
- ✓ This resistance is because of
  a. Fear of loss of job
  b. Fear of loss of authority
  c. Changed social relations
  d. Fear of learning new technology
- ✓ Organizations should not forget that the biggest enable of an IS are the people.
- ✓ The social/behavioural aspects of the IS are required to be understood properly before the implementation of IS.

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BALAJI INSTITUTE OF IT & MANAGEMENT

Icet Code: BIMK

SUBJECT: MANAGEMENT INFORMATION SYSTEM (MIS)

Regulation: R17

IF YOU WANT TO SHINE LIKE A SUN FIRST BURN LIKE A SUN

UNIT-5

PREVIOUS YEAR QUESTIONS

1. Explain how the internet challenges, protection of individual privacy and intellectual property.

OR

2. (a)Define malware and distinguish among a virus,a worm and a Trojan horse.
(b)Explain how information systems auditing promotes security and control.
(Jan 2020 regular and supply)

3. (a)Explain how security threats and information systems vulnerability has increased over a period.
(b) Describe how encryption/decryption prevents unauthorized person read or change the messages.

OR

4. (a)List the moral dimensions related to information systems.
(b)Discuss the implications of professional codes of conduct and ethics.**(October 2020 supply)**
5. Discuss the various types of information system.

OR

6.Give the classifications of IS security technologies.**(dec/jan 2018/19 reg & supply)**
7.Explain about recent trends in IS security threats? (**2018 regular**)

OR

8.Discuss about IS ethical and social issues? (dec/jan**2017/18 regular)**

THE PAST CANNOT BE CHANGED.THE FUTURE IS YET IN YOUR POWER

Code: 21E00106

MBA I Semester Regular Examinations May 2022

MANAGEMENT INFORMATION SYSTEMS

(Common to BDA, BigDA, B&FS, MBA (GM&BM), Fintech and Finance)

(For students admitted in 2021 only)

Time: 3 hours Max. Marks: 60

All questions carry equal marks

*****

SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

1	Explain the need for MIS and their characteristics and structure.	10M
	OR	
2	Write the objectives of management information systems. Explain how the MIS meets the needs of managers?	10M
3	Define data model. Explain modern data base management approaches.	10M
	OR	
4	Explain the term 'data mining'. Describe various data mining techniques.	10M
5	Give short notes on: (i) CRM. (ii) SCM. (iii) DSS.	10M
	OR	
6	Write short notes on: (i) ERP. (ii) Types of decisions.	10M
7	Write the steps in project management.	10M
	OR	
8	How the software engineering qualities can be assured in real life?	10M
9	Discuss the various types of information system.	10M
	OR	
10	Briefly describe IS security threats.	10M

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

11	**Case Study/Problem:**	
	Saab Cars USA imports more than 37,000 Saab sedans, convertibles, and wagons annually and distributes the cars to 220 U.S delegates. Saab competes in the premium automotives market and its primary rivals attract customers through aggressive marketing campaigns, reduced prices and in expensive financing. Saab decided that the answer to beating its competition was not to spend capital on additional advertising, but to invest in Siebel Automotives, a customer relationship management system.	10M

Contd. in page 2

Until recently, the company communicated with its customers through three primary channels: (1) Dealer network. (2) Customer assistance centre. (3) Lead Saab required a solution that would provide a consolidated customer view from all three touch points. In 2002, Saab implemented Siebel CRM solution, which provided Saab's call centre employees with a 360degree view of each customer, including prior service related questions and all the marketing communications they have received. Known internally as "Touch Point", the Siebel application provides Saab's dealers with a powerful Web based solution for coordinating sales and marketing activities. These tracking capabilities enable Saab to measure the sales results of specific leads, recommend more efficient selling techniques, and target its leads more precisely in the future. Using Siebel Automotive, Saab receive the following benefits:

- Direct marketing costs decreased by 5 percent
- Lead follow-up increased from 38 percent to 50 percent
- Customer satisfaction increased from 69 percent to 75 percent
- Saab gained a single view of its customers across multiple channels

Questions:

(a) Explain how implementing a CRM system enabled Saab to gain a competitive advantage.

(b) Estimate the potential impact to Saab's business if it had not implemented a CRM system.

(c) What additional benefits could Saab receive from implementing a supply chain management system?

*****

Code: 21E00106

MBA I Semester Supplementary Examinations October 2022

MANAGEMENT INFORMATION SYSTEMS

(Common to BDA, BigDA, B&FS, MBA (GM&BM), Fintech and Finance)

(For students admitted in 2021 only)

Time: 3 hours Max. Marks: 60

All questions carry equal marks

*****

SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

1	Discuss in detail about the challenges of managing MIS.	10M
	OR	
2	What are characteristics of MIS? Explain in detail types of MIS system.	10M
3	Explain data warehousing and data mining in detail.	10M
	OR	
4	How DBMS is superior to conventional file processing system? List out the salient features of DBMS.	10M
5	What are the steps involved in the decision-making process.	10M
	OR	
6	Describe the following: (i) SCM. (ii) Decision support techniques.	10M
7	Explain the planning and implementation phase of SDLC (System Development Life Cycle).	10M
	OR	
8	Define project. Explain the different types of project.	10M
9	Give the classifications of IS security technologies.	10M
	OR	
10	Enumerate on information systems and social issues.	10M

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

11	**Case Study/Problem:**	10M

General electric's research and development centre has developed a natural language system called SCISOR (System for conceptual information summarization, organization, and retrieval) that performs text analysis and question -answering in a limited, predefined subject area (called a constrained domain). One application of this system deals with analysing financial news. For example, SCISOR automatically selects and analyses stories about corporate mergers and acquisitions from the online financial service of Dow Jones. It can process news in less than 10 seconds per story. First, it determines whether the story is about a corporate merger or acquisition.

Contd. in page 2

Then, it selects information such as the target, suitor, and price per share. The system allows the user to browse and ask questions such as, “What price was offered for Polaroid?” or “How much was Bruck plastics sold for?” The system’s effectiveness was demonstrated in testing when it proved to be 100 percent accurate in identifying all 31 mergers and acquisitions stories that were included in a universe of 731 financial news releases from the newswire service. A similar application is a web -based personalized news system that was developed in Singapore to track business news available in English, Chinese, and Malay, summarize it, and extract desired personalized news in any of these languages.

Questions:

(i) What are the benefits of analysing financial news via a machine?

(ii) What other applications might be developed with this type of system?

(iii) How could such a system be combined with an internet news dissemination portal such as money.cnn.com?

(iv) Discuss the reliability factor of such a system.

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Code: 17E00106

MBA I Semester Supplementary Examinations October 2020

MANAGEMENT INFORMATION SYSTEMS

(For students admitted in 2017, 2018 & 2019 only)

Time: 3 hours Max. Marks: 60

All questions carry equal marks

*****

SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

1 (a) Define 'Management Information System (MIS)'. Explain its need in business.
(b) Illustrate the basic structure of MIS.

OR

2 (a) Describe the role of MIS in global business.
(b) Highlight the important characteristics of MIS.

3 (a) Define a database management system (DBMS) and describe how it works.
(b) Explain how DBMS benefits business organisations.

OR

4 (a) What is data mining? What is the difference between data mining and data dredging?
(b) What is the goal of data mining?

5 (a) State the objectives of customer relationship management (CRM).
(b) Explain how information systems support each objective of CRM.

OR

6 (a) Define 'supply chain management' (SCM)? Give the examples of SCM software.
(b) Illustrate the typical components of an enterprise resource planning system.

7 (a) Define information requirements and explain why they are important for developing a system solution.
(b) Define the traditional systems development life cycle (SDLC) and describe its advantages and disadvantages for systems building.

OR

8 (a) Describe how cost-benefit analysis can be used to establish the worth of systems.
(b) Define the user–designer communications gap and explain the kinds of implementation problems it creates.

9 (a) Explain how security threats and information systems vulnerability has increased over a period.
(b) Describe how encryption/decryption prevents unauthorised person read or change the messages.

OR

10 (a) List the moral dimensions related to information systems.
(b) Discuss the implications of professional codes of conduct and ethics.

Contd. in page 2

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

11 **Case Study:**

A mobile company is developing mobile banking system. Company is offering more than one mobile to a customer – the mobile company offers facilities like music on demand, internet, alerts and messages, electricity bill payment etc. Customer can choose facilities he wants customer can pay bill other in cash. Using credit card or through ECS. The bill shows details about tariff, facility charges and rent. As a analyst design a system having:

Questions:

(a) Input screen for application for new mobile number.

(b) Format of pending bill report.

(c) Format of service wise customer report.

*****

Code: 17E00106

MBA & MBA (Finance) I Semester Regular & Supplementary Examinations January 2020

MANAGEMENT INFORMATION SYSTEMS

(For students admitted in 2017, 2018 & 2019 only)

Time: 3 hours Max. Marks: 60

All questions carry equal marks

*****

SECTION – A

(Answer the following: 05 X 10 = 50 Marks)

1 Discuss the nature and scope of management information system. Explain why information systems are so important for business today.

OR

2 (a) Distinguish between data and information, information systems and computer systems.
(b) State the challenges of managing information systems in today's business environment.

3 (a) State the main characteristics of a database
(b) Distinguish between traditional and modern database management approaches.

OR

4 (a) What is data warehouse and discuss its merits and demerits.
(b) What are the business benefits of using intelligent techniques for knowledge management?

5 (a) Describe different types of decisions with examples.
(b) Explain how the decision-making process works.

OR

6 (a) Discuss how business intelligence support decision making.
(b) Describe the major types of knowledge management systems and applications of each type.

7 (a) What is the need to link information systems plan to overall business plan and how it is done?
(b) Illustrate various system development models.

OR

8 (a) Explain the procedure of product based MIS evaluation.
(b) Distinguish between systems analysis and systems design.

9 Explain how the Internet challenges, protection of individual privacy and intellectual property.

OR

10 (a) Define malware and distinguish among a virus, a worm, and a Trojan horse.
(b) Explain how information systems auditing promotes security and control.

SECTION – B

(Compulsory question, 01 X 10 = 10 Marks)

11 **Case Study:**

A new on-line teller system design for a medium size bank was approved by the president, signaling the beginning of implementation. The project leader devised a master plan to specify who is to perform each task and in what order. New deposit slips and withdrawers were ordered and delivered three weeks before implementation. In the interim, copies of the user manual were prepared for the lobby and drive-in-tellers.

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Soon after the terminals were installed, the tellers begin to learn how to enter various transactions. After training sessions were over, they had a chance to ask questions and enquire about the new system. Once completed, the telephone company and the computer service representative hooked up the terminal on-line with the master system.

The following Monday (a week before actual conversion), the analyst asked the head teller whether the tellers would come in on Saturday to catch up on their work and run test data to reinforce recent training. The head teller agreed to overtime, but on Saturday, only 12 of 17 tellers showed up. During that time, the entire system was checked out and functioned as expected.

The bank opened the following Monday, the online system operated normally. Customers were greeted at the door by the president. Coffee and cake were served in the lobby. At the end of the day, the analyst sent a report to the board directors informing them that the system was now in operation and all user requirements had been met.

Three weeks later the analyst was called to the board meeting. The chairman criticized the analyst for exceeding the budgeted amount approved by the board. Furthermore the authorization the analyst gave the terminal vendor to bring in two CRT screens to expedite information retrieval exceeded his authority to implement the system. The bank's auditor also estimated that it would take 3.8 years rather than the initial estimate of 2.1 years to break even on the total cost of the installation. Not knowing what to say, the analyst left the board room with a feeling of total failure.

Questions:

(a) What are the major problems in the case? Who is to blame? Why?

(b) Was the board chairman justified in his criticism of the analyst? Explain.

(c) Discuss whether the analyst succeeded in implementation of the system.

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