

# **MANAGEMENT INFORMATION SYSTEM**

UNIT-1

# What is MIS ?

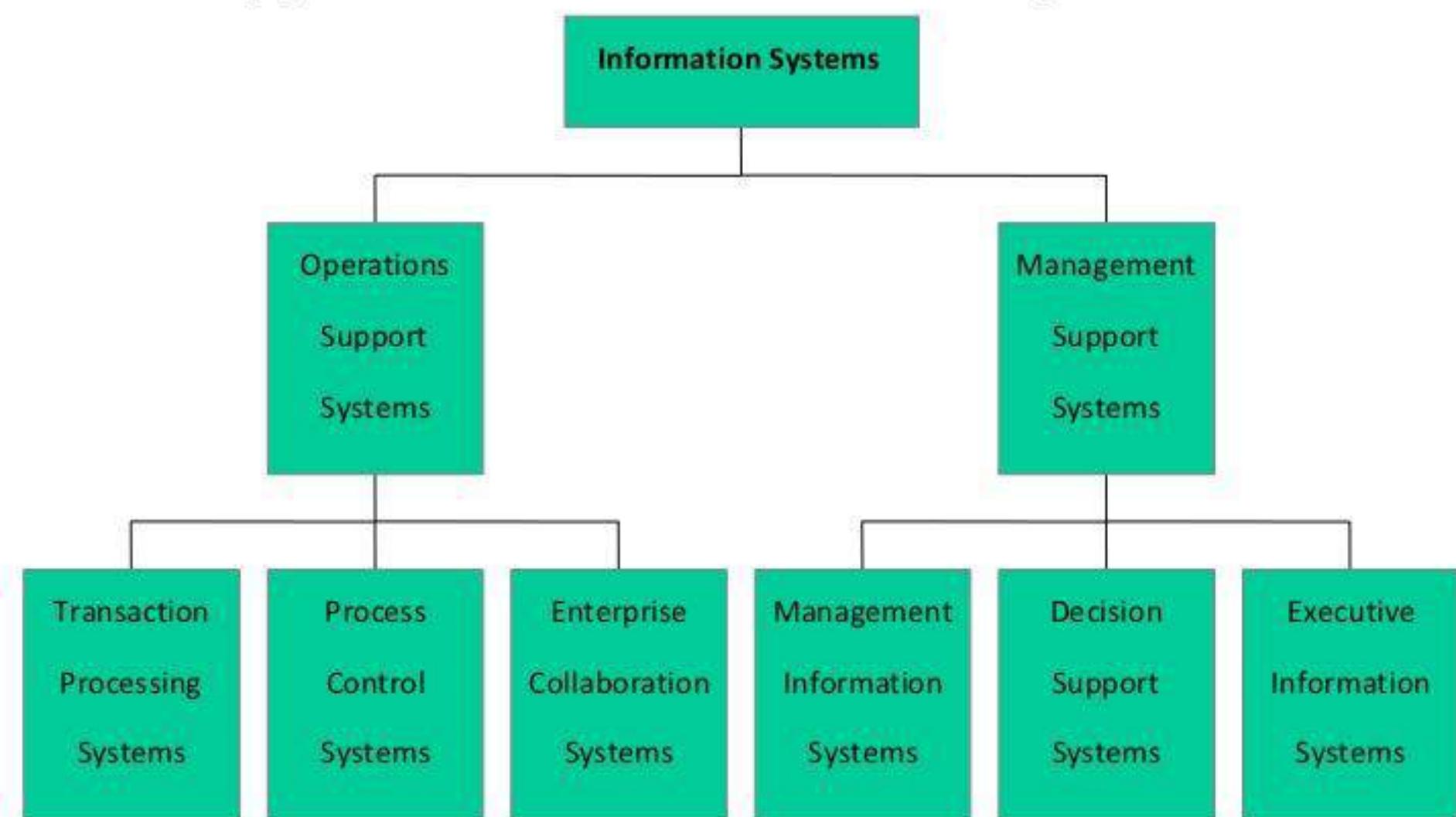
- **Management information systems (MIS)**
  - is the **study of people, technology, organizations, and the relationships among them.**
  - MIS professionals **help firms realize maximum benefit** from investment in personnel, equipment, and business processes.
  - **MIS is a people-oriented field** with an emphasis on service through technology.
  - **Management information systems are typically computer systems used for data managing** to make searching, analyzing data, and spring information easier.

## BASIC CONCEPTS

Management Information System (MIS) provides information for the managerial activities in an organization. The main purpose of this research is, MIS provides accurate and timely information necessary to facilitate the decision-making process and enable the organizations planning, control, and operational functions to be carried out effectively.

Management Information System (MIS) is basically concerned with processing data into information and is then communicated to the various Departments in an organization for appropriate decision-making.

# Types of Information Systems



# **Types of the System in the Management Information Systems**

## **1. Conceptual Systems**

- a. Are theoretical and explanatory in the nature.
- b. Provide the much needed clarification.
- c. Provide theoretical framework for which there may or may not be any real life counterpart.
- d. E.g. of such systems can be philosophy, theology etc.

## **2. Empirical Systems**

- a. Are very practical, specific and also very operational in the nature.
- b. Can be based on the conceptual system.
- c. Examination system, surgery act as very good examples of the empirical systems.

## **3. Open Systems**

- a. Involve continuous interaction with the environment.
- b. So exchanges the information, material, energy with the environment.
- c. Is open and also self organizing in the nature.
- d. Is also adoptive or adaptive to the changing environment as it is flexible.

## **4. Closed Systems**

- b. Is rigid in nature.
- c. Is not at all amenable to the change.
- d. Is also self contained.
- e. Is somewhat isolated in the nature.
- f. Is having a well defined boundary.
- g. Is not at all adaptive in the nature.

# System Approach ....

It is a framework or method used to aid and help to analyse and explore the operation and interactions which exist in the systems around us.

A definition of system as used by the Open University is:

A system is an assembly of parts where:

- ✓ The parts or components are connected together in an organised way.
- ✓ The parts or components are affected by being in the system (and are changed by leaving it)
- ✓ The assembly does something
- ✓ The assembly has been identified by a person as being part of special interest.

## Features or Characteristics of Information

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

# Types of information:

## 1. Primary (Think of this as Firsthand)

Primary information is comprised of original materials that were created firsthand. This type of information is from the time period involved and has not been filtered through interpretation.

Examples are:

- Diaries
- Interviews (legal proceedings, personal, telephone, email)
- Letters
- Original Documents (i.e. birth certificate or a trial transcript)
- Patents
- Photographs
- Proceedings of Meetings, Conferences and Symposia.
- Survey Research (such as market surveys and public opinion polls)
- Works of Literature

# Types of information (Contd....):

## 2. Secondary (Think of this as Second Hand)

Secondary information is made up of accounts written after the fact with the benefit of hindsight. It is comprised of interpretations and evaluations of primary information. Secondary information is not evidence, but rather commentary on and discussion of evidence.

Examples are:

- Biographies
- Books
- Commentaries
- Dissertations
- Indexes, Abstracts, Bibliographies (used to locate primary & secondary sources)
- Journal Articles

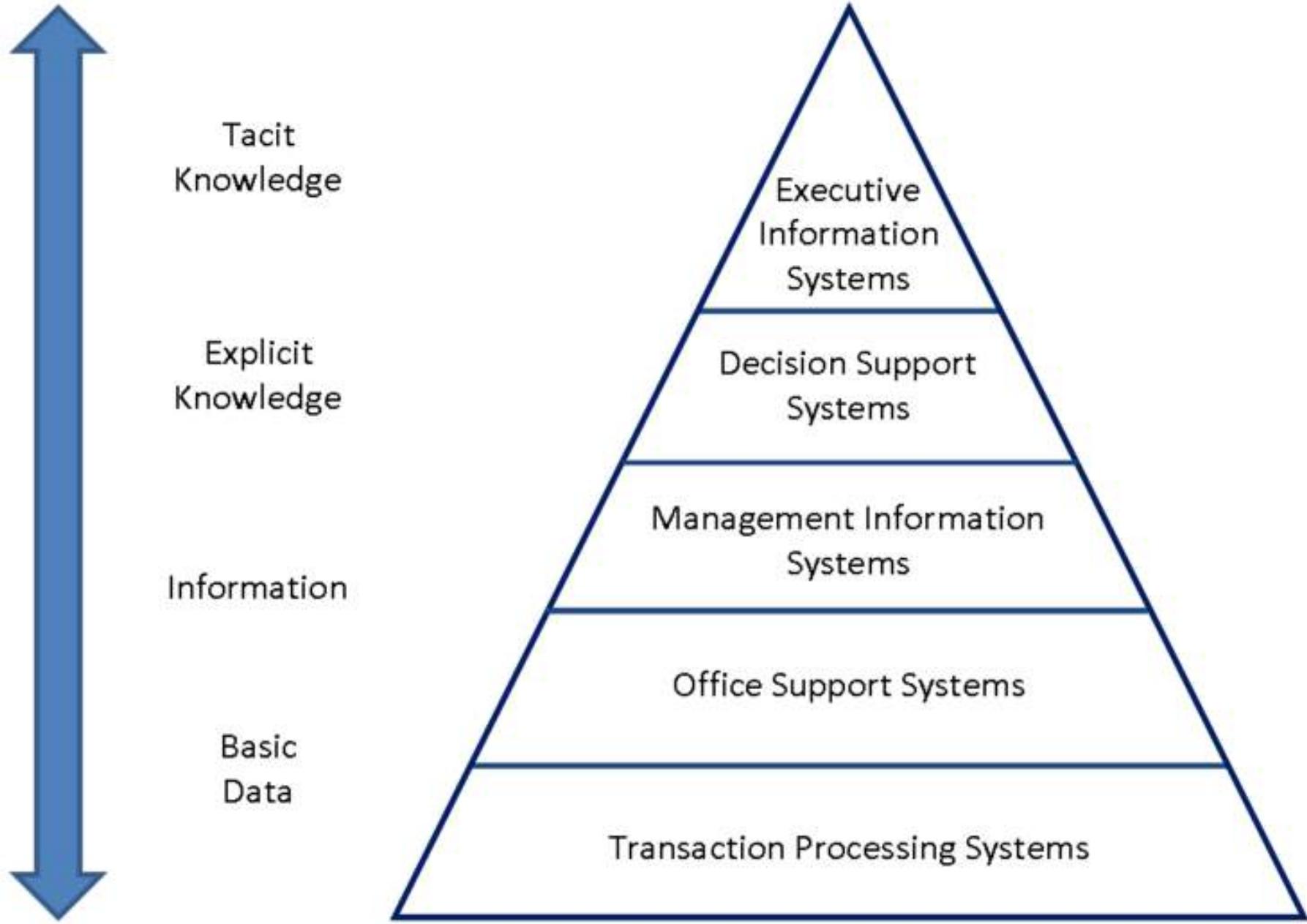
## Types of information(Contd....):

### 3. **Tertiary** (Think of this as Third Hand)

Tertiary information is a distillation and collection of primary and secondary information.

Examples are:

- Almanacs
- Encyclopedias
- Fact books



# ROLE OF INFORMATION IN DECISION MAKING

- The decision making process includes the following stages:
- **Identification and structuring of problem:** One needs information to identify a problem and put it in a structured manner.
- **Putting the problem in a context:** Without information about the context in which the problem has occurred, one cannot take any decision on it. In a way , the context defines the problem.

- **Generation of alternatives:** Information is a key ingredient in the generation of alternatives for decision-making.
- **Choice of the best alternative:** Based on the information about the suitability of the alternatives, a choice is made to select the best alternative.

# EDP- ELECTRONIC DATA PROCESSING

- Electronic data processing (EDP) is the process of collecting data and processing them to produce meaningful information by using computers, processing software and standard database tools. It is the latest technique for processing large chunks of data. It is a fast, efficient and reliable technique.



# EDP/MIS/DSS

- EDP was first applied to the lower operational levels of the organization to automate the paperwork.
- Characteristics:
  - A focus on data, storage, processing and flows at the operational level.
  - Efficient transaction processing.
  - Scheduled and optimized computer runs.
  - Integrated files for related jobs.
  - Summary reports for management.
  - EDP level of activity in many firms has become an efficient facility for transaction processing.



# EDP and MIS

- EDP:

- These systems process mostly clerical and supervisory type of applications related to record keeping, processing of large volume of data and generation of authentic and accurate reports for operational management.
- These systems offer cost reduction by saving upon manpower and time resource.
- These serve as information source to operational management and assist in operational control and planning.
- Application Uses: Payroll, Inventory control, Production, Costing, Purchase and Logistics.



# EDP/MIS/DSS...

- MIS:

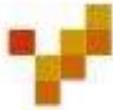
- An information focus, which is aimed at middle managers.
- A structured information flow.
- Integration of EDP by business functions.
- Inquiry and report generation with a database.
- When controls are incorporated in an EDP application, then these are upgraded to MIS applications.

# **Historic Development**

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<b>EDP</b>	-	Focus on Data
<b>OAS</b>	-	Focus on Communication
<b>MIS</b>	-	Focus on Information
<b>DSS</b>	-	Focus on Decision Support
<b>EIS</b>	-	Focus on Decision Support for Top Management
<b>ES</b>	-	Focus on Consultation
<b>AI</b>	-	Focus on self-learning / thinking systems

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# EDP/MIS/DSS...

- DSS:

- It is focused higher in the organization with an emphasis on the following characteristics:
  - Decision focused
  - Aimed at top managers and executive decision makers.
  - Emphasis on flexibility, adaptability and quick response.
  - User initiated and controlled.
  - Support for the personal decision making styles of individual managers.

# MANAGEMENT INFORMATION SYSTEM

## VERSUS

# DECISION SUPPORT SYSTEM

## MANAGEMENT INFORMATION SYSTEM

An information system that evaluates, analyzes, and processes an organization's data to produce meaningful and useful information based on which the management can take right decisions

Supports structured decision making

Provides information to support internal operations

Uses a large volume of data as the input and gives a summarized report as the output

Focuses on operational efficiency

Used by middle and low-level management

## DECISION SUPPORT SYSTEM

An information system that supports business or organizational decision-making activities

Supports unstructured or semi-structured decisions

Provides information to support specific situations

Uses a low volume of data as the input and gives a decision analysis as the output

Focuses on making effective decisions

Used by senior managers and analysts

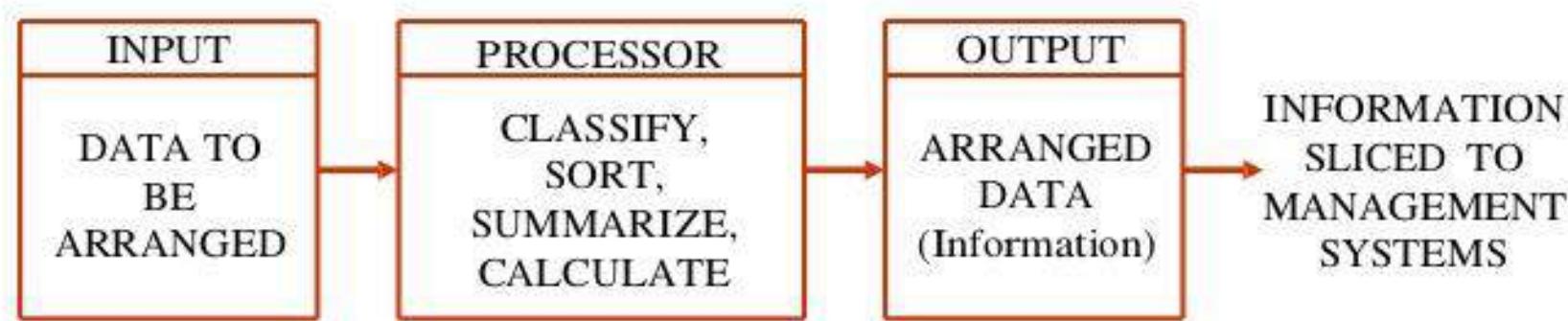
# **UNIT-2**

# CHARACTERISTICS OF MIS

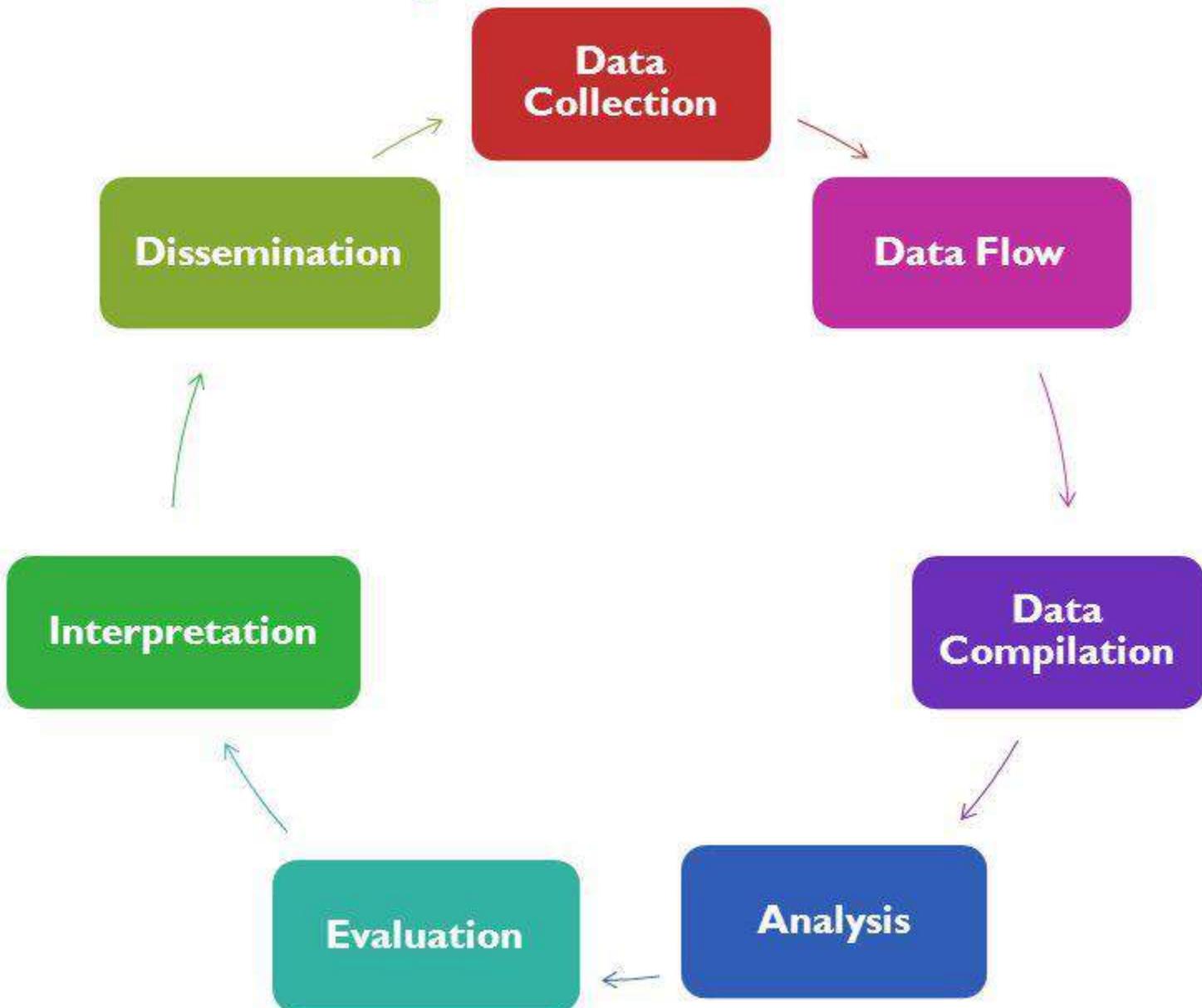
- Avoid GIGO (Garbage In Garbage Out) : The correct input of a system always gives accurate information. So, GIGO must be avoided.
- Information produced should be trust worthy. The processing should not hide vital information which may point out the efficiency of some individuals.
- The information should be complete it should include all data, not partial data.
- The information should be timely. Delayed information may sometimes be of no use. So, whenever it should be required it should be available.
- The information should be presented in such a way that manager may immediately perceives its significance. The graphical presentation of information is a very effective way.
- Information should be designed according to the needs of the user and be relevant to him. Because irrelevant information always waste a lot of managers time.



# COMPONENTS OF MIS



# Components of MIS

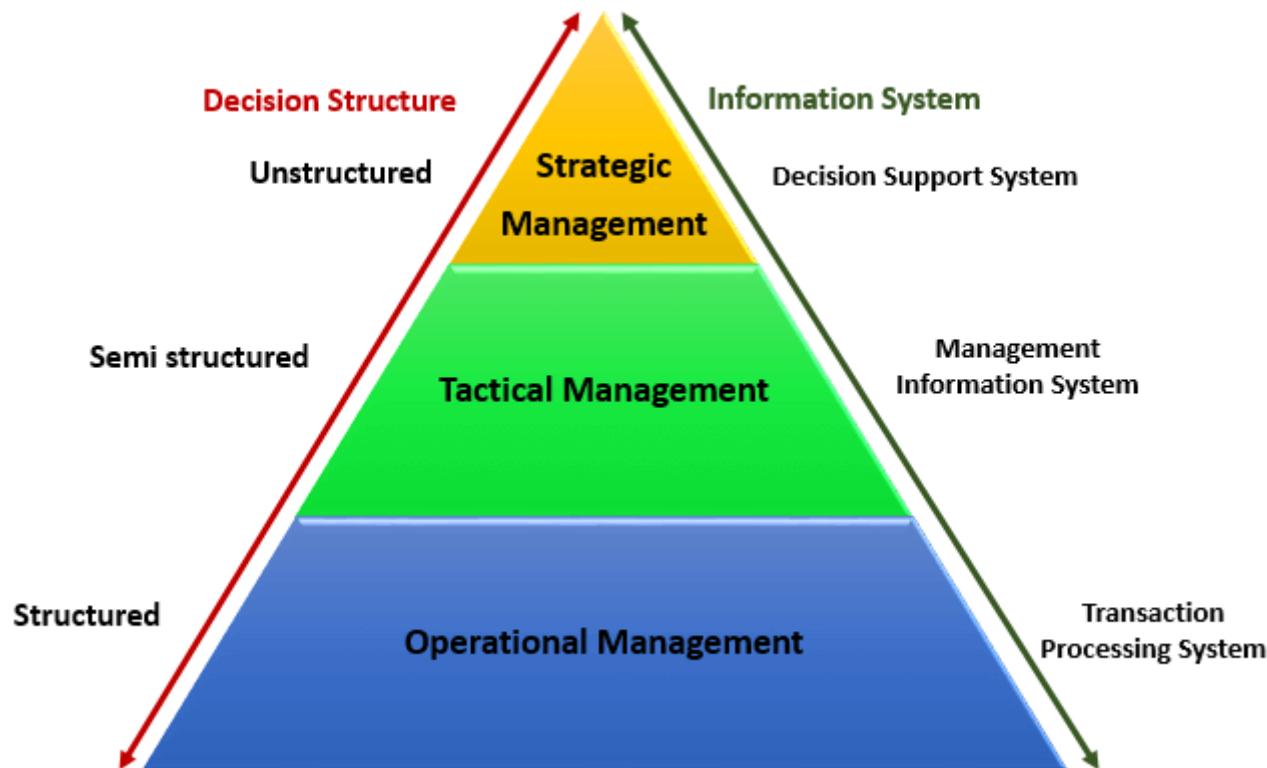


# Components Of MIS :-



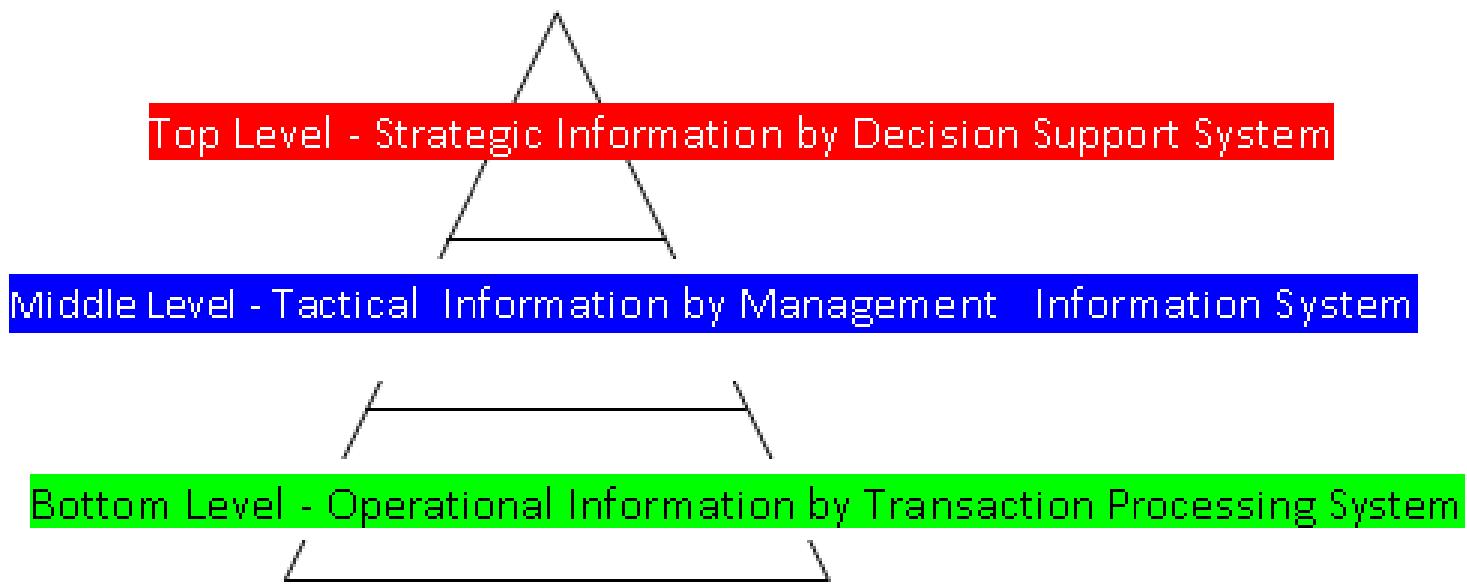
- 1. Resources of people: (end users and IS specialists, system analyst, programmers, data administrators etc.).
- 2. Hardware: (Physical computer equipments and associate device, machines and media).
- 3. Software: (programs and procedures).
- 4. Data: (data and knowledge bases)
- 5. Networks: (communications media and network support).

# Information requirements & Levels of Management



# **MANAGEMENT STRUCTURE**

- In management structure we have three levels.
- Top Level
- Middle Level and
- Line Managers(Operating Management)
- A graphical representation of management structure is known as organisation chart.



- **Top Level** : Top Management performs the strategic planning processes. The basic function in strategic planning are to establishes the polices, plans, and objectives of the company, as well as a general budget framework under which the various departments will operate. These factors are passes down to middle level or management.
- **Middle Level** : Middle Management manages the management control processes (tactical planning processes). The middle level translate the factors passed by top management into specific revenue, cost, and profit goals using tactical planning. These are reviewed, analysed and modified in accordance with the overall planes and policies untill agreement is reached. Then middle management, issues the specific schedules and measurement scales to operating level.
- **Line Managers** : Line managers manages the operational planning process. This level has the job of producing the goods and services required to meet the revenue and profit goals, which in turn will enable the company to reach its overall plans and objectives.
- Hence, we can say in simple words the middle level managers reports to the top level manager who is the overall incharge of the organisation. The middle level managers have many assistants who are responsible for specific day to day operations. They are known as line managers.

## About Simon's Model

**It is a three-phase model of problem solving.**

**Simon's model continues to withstand the test of time and, even today, serves as the basis of most models of management decision making.**

**Notice that the model depicts the problem-solving process as a flow of events that can proceed in either a linear or iterative fashion.**

**That is, at any point in the process, the problem solver may choose to return to the previous step(s) for additional refinement.**

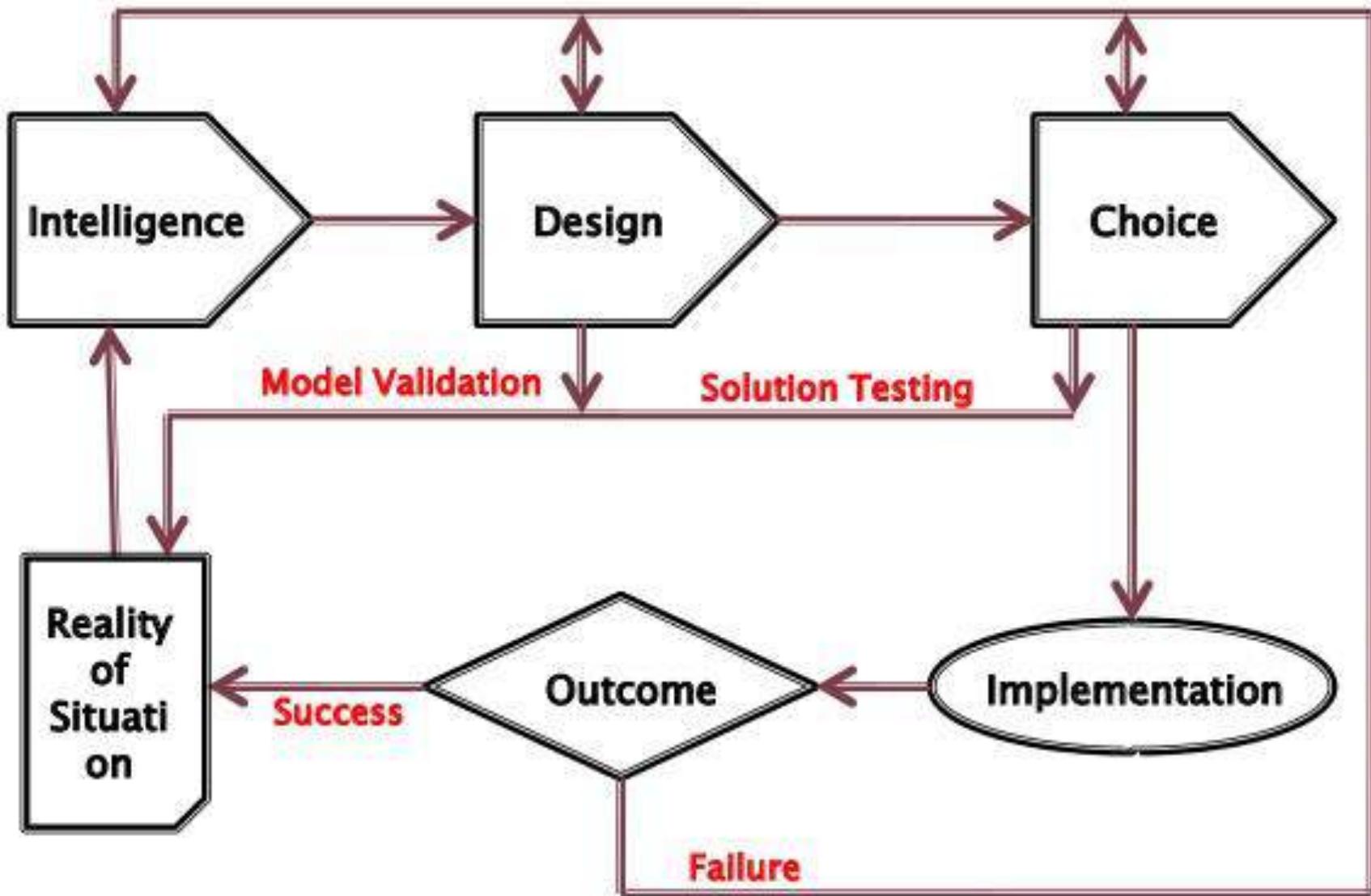


Figure: Simon's Model of Problem Solving

# Intelligence

**The problem is identified, and information is collected concerning the problem.**

**This can be a long process, as the decision to be made comes from the information.**

**The intelligence stage may involve, for example, comparing the current status of a project or process with its plan.**

**The end result of the intelligence phase is a decision statement.**

# Design

**The design phase develops several possible solutions for the problem.**

**This phase may involve a great deal of research into the available options.**

# Choice

In this phase, we evaluate the alternatives that we developed in the design phase and choose one of them.

The end product of this phase is a decision that we can carry out.

# Implementation

The decision that is ultimately carried out.

The intelligence, design and choice we have made will be implemented in this phase.

# Reality of Situation

After implementing the previous phases, we find the outcome.

If the outcome is a failure then we have to start the procedure again or just go to the previous phase and check for any mistake or error.

And if the outcome is a success then we will compare it with the reality of situation to check whether the decision is required one or not.

# Structured Vs. Unstructured Decisions

- Structured decisions
  - Understood and accepted decisions
    - Formula for computing reorder quantity
    - Standard method for allocating furniture
- Unstructured decisions
  - No agreed-on decision-making method
  - Not standardized
    - Predicting future direction of economy
    - Assessing how well-suited an employee is for performing a task

## Q2: What Is the Difference Between Structured and Unstructured Decisions?

### Structured decisions

Understood and accepted method for making decision

Formula for computing reorder quantity

Allocating furniture and equipment to employees

### Unstructured decisions

No agreed-on or standardized decision-making method

Predicting direction of economy or stock market

How well suited an employee is for a particular job

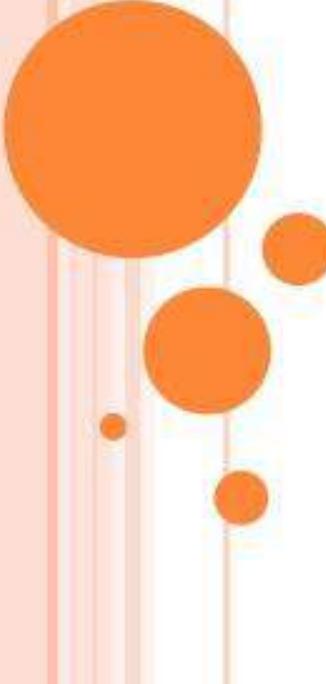
- Formal Information System:

A formal information system is based on the organisation represented by the organization chart. The chart is a map of position and their authority relationship, indicated by boxes and connected by straight lines. it is concerned with the pattern of authority, communication and work flow.

### Informal Information System:

The informal information system is employee based system design to meet personnel and vocational needs and to help in the solution of work-related problems. it also funnels information upward through indirect channels. In this way, it is considered to be a useful system because it works within the framework of the business and its stated policies.

# Unit-3



# **ANALYSIS AND DESIGN OF INFORMATION SYSTEM**

# INTRODUCTION

- Information Systems Analysis and Design
  - Complex organizational process whereby computer-based information systems are developed and maintained



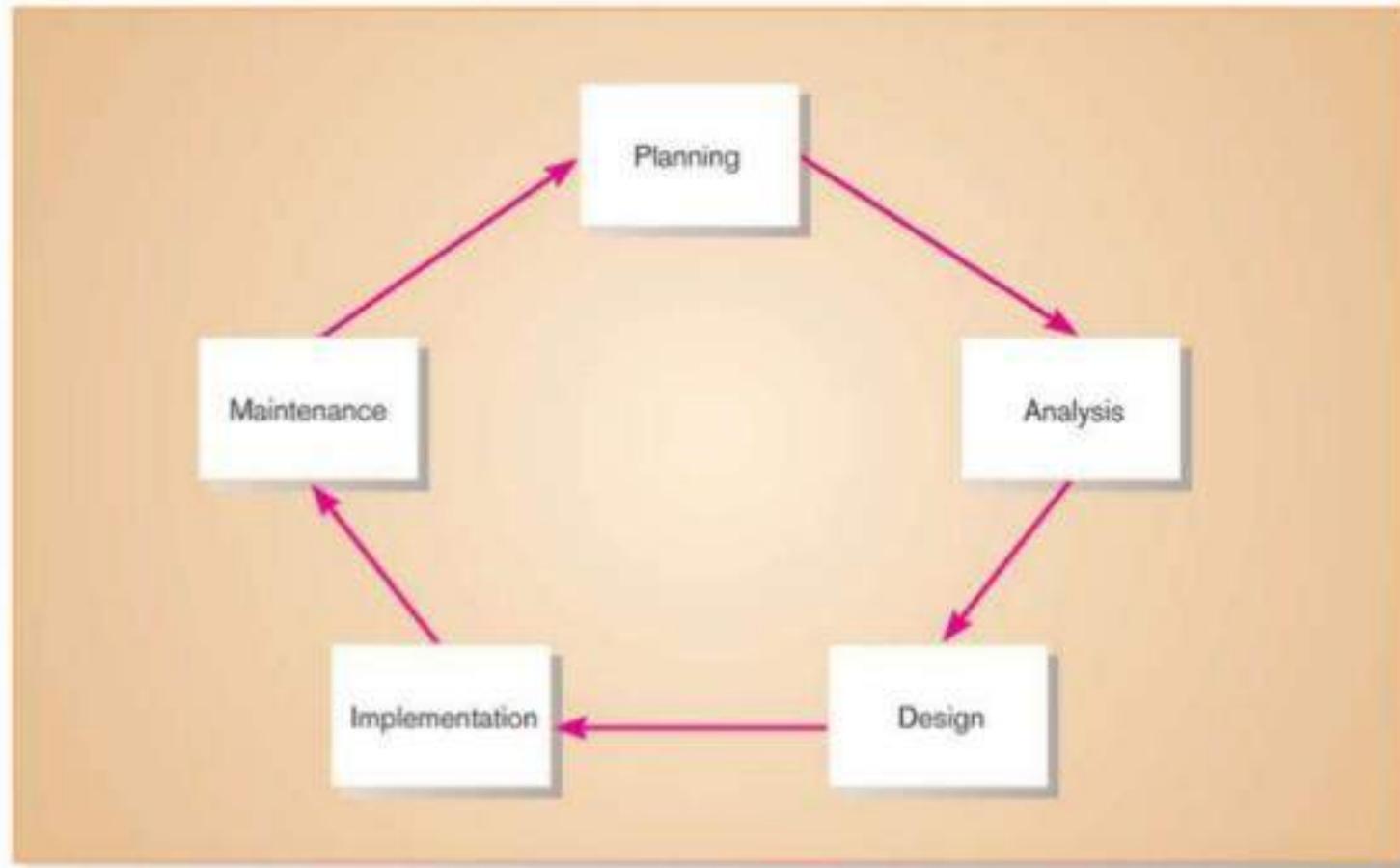
## SYSTEM DEVELOPMENT LIFE CYCLE

- Traditional methodology for developing, maintaining, and replacing information systems
- Phases in SDLC:
  - Planning
  - Analysis
  - Design
  - Implementation
  - Maintenance



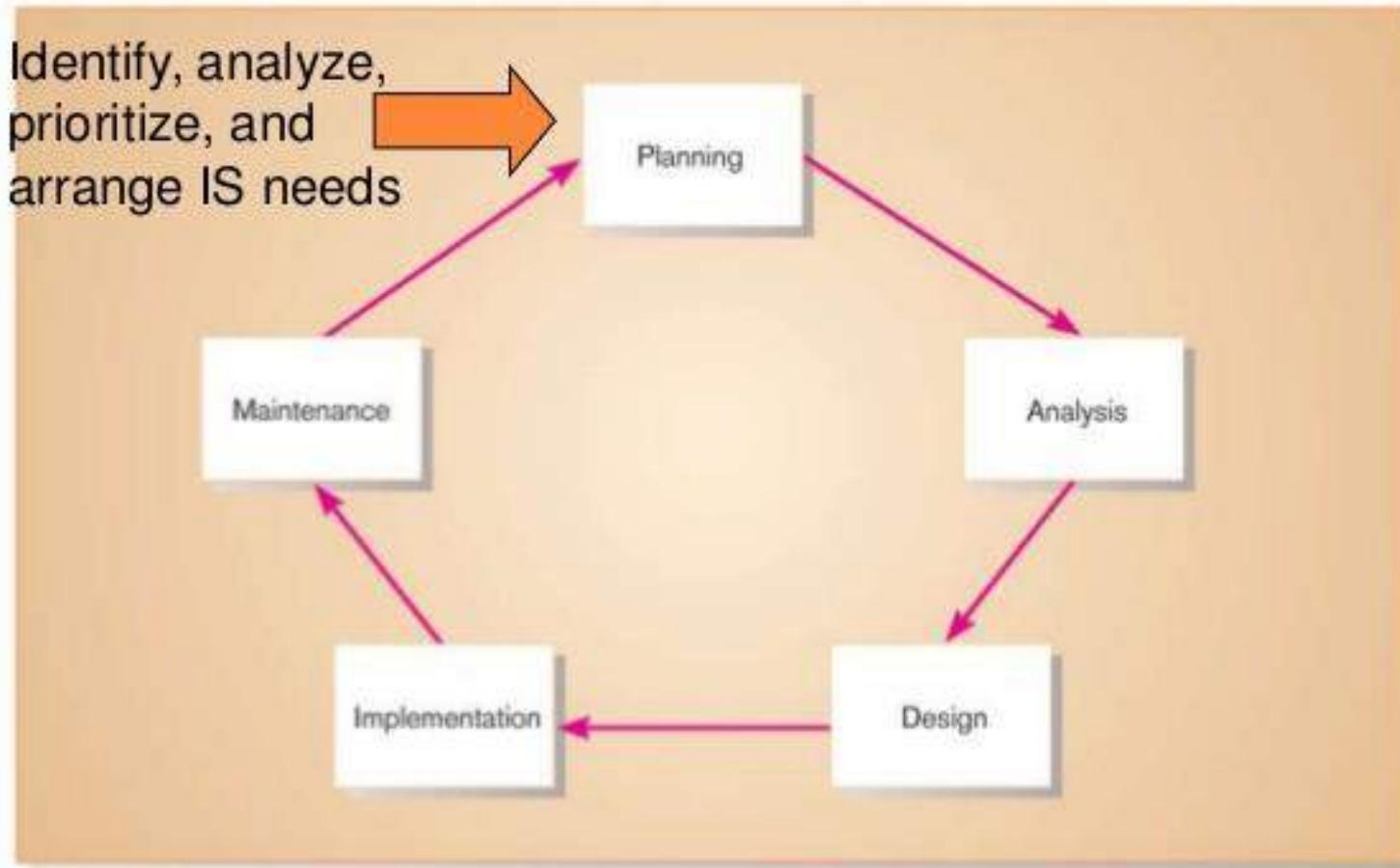
# THE SYSTEM DEVELOPMENT LIFE CYCLE

**Figure 1-3** The systems development life cycle



# THE PLANNING PHASE

**Figure 1-3** The systems development life cycle



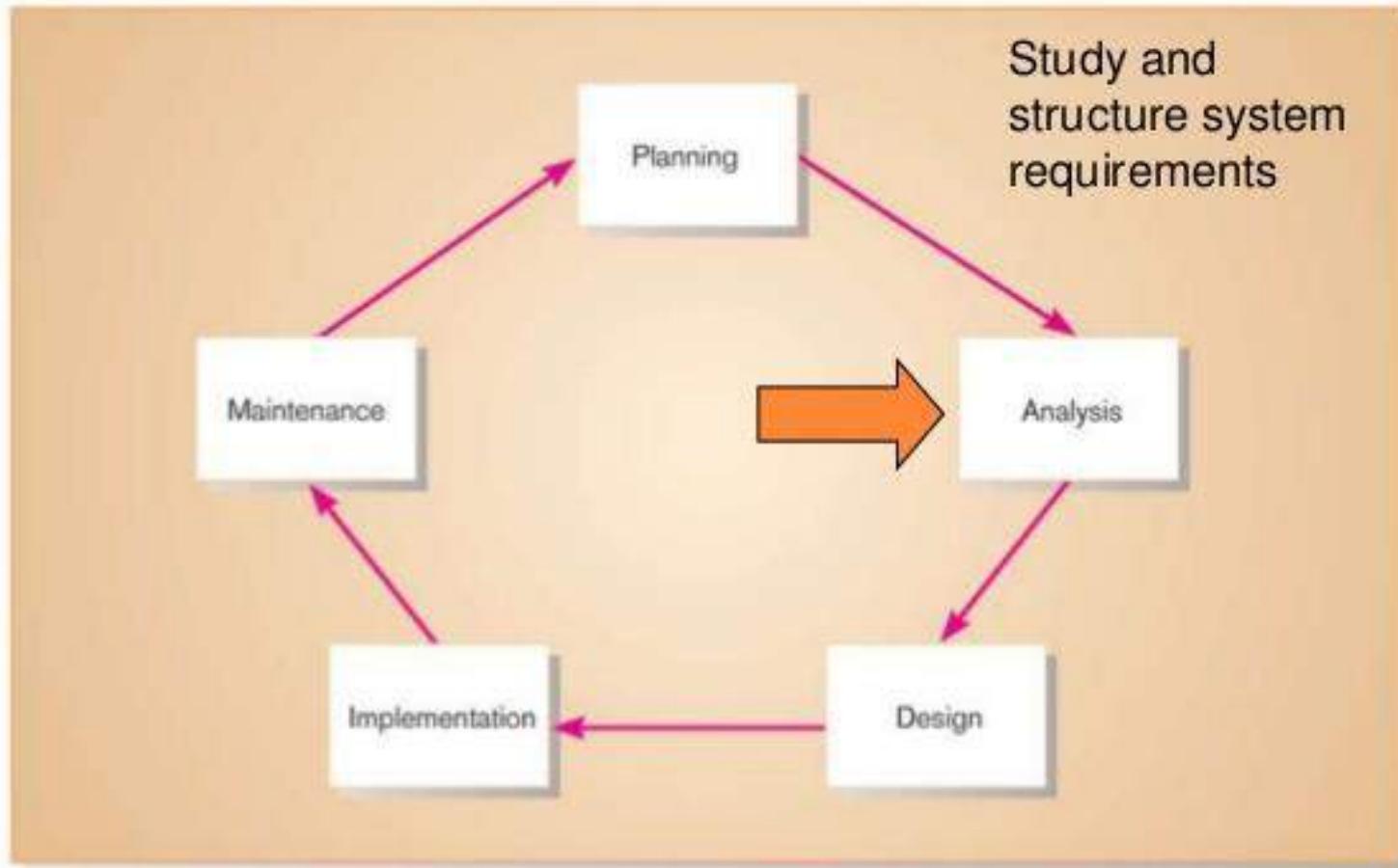
## INTRODUCTION

## ANALYSIS

- Analysis as 'the breaking up of any whole so as to find out their nature, function etc.'
- Analysis gives the conceptual understanding of a system from the logical point of view by detailing its functionality.



**Figure 1-3** The systems development life cycle



## DESIGN

- Design as 'to make preliminary sketches of; to sketch a pattern or outline for; to plan and carry out especially by artistic arrangement or in a skilful way.'
- Designing gives us the blueprint on the basis of which the actual system is developed

# ANALYSIS CONCEPTS AND PRINCIPLES

## o Requirement analysis

- Requirement analysis is a formal process of interacting with a client to understand and then put in a formal document the requirement of the client.
- While initiating the process of requirement elicitation and analysis, some key issues must be understood so that analysis is easier, they are:
- The key people driving the request. This will help them to focus their information gathering activity.



## SYSTEM REQUIREMENT SPECIFICATION

- **Information description** : where the detailed information description is given.
- **Functional description** : where the functionality required from the system is given.
- **Validation description** : this is the data validation and business rule description required in the system.



## DESIGN PRINCIPLE

- It should have an overall macro view of the system rather than a tunnel view
- The design process should be logical.
- The design should reinvent the wheel.
- The design should be a very close abstraction of the problem.
- The design should be uniform and integrated
- The design should be structured
- The design should be reviewed on a real-time basis to minimize errors.



## DESIGN CONCEPT

- Abstraction
  - Procedural abstraction
  - Data abstraction
  - Control abstraction
- Refinement
- Modularity



## ABSTRACTION

- Abstraction is the conceptualization of an issue or problem or entity in terms of some level of generalization without regarding to irrelevant low-level details.
- **Procedural abstraction** : it is a named collection of several sequential procedural steps.
- **Data abstraction** : this is name of a set of data that defines of an object.
- **Control abstraction** : this is a named control mechanism, which has several steps.



## REFINEMENT

- Refinement helps the designer in elaborating the system and bringing-out lower-level details as the design progress.
- This is a top- down design strategy in which design is refined after each successive step.



## MODULARITY

- It helps the designer to compartmentalize the design into functional compartments as the entire system can be conceived to be composed of a set of modules, each having its own special feature and functionality rather than a monolithic entity.
- Modularity helps the designer to comprehend the system better.
- Effective modular design in general reduces the complexity of the system by dividing system into easily understandable modules.



## TOOL FOR DESIGN

- Data flow diagram(DFD)
- Data dictionary(DD)



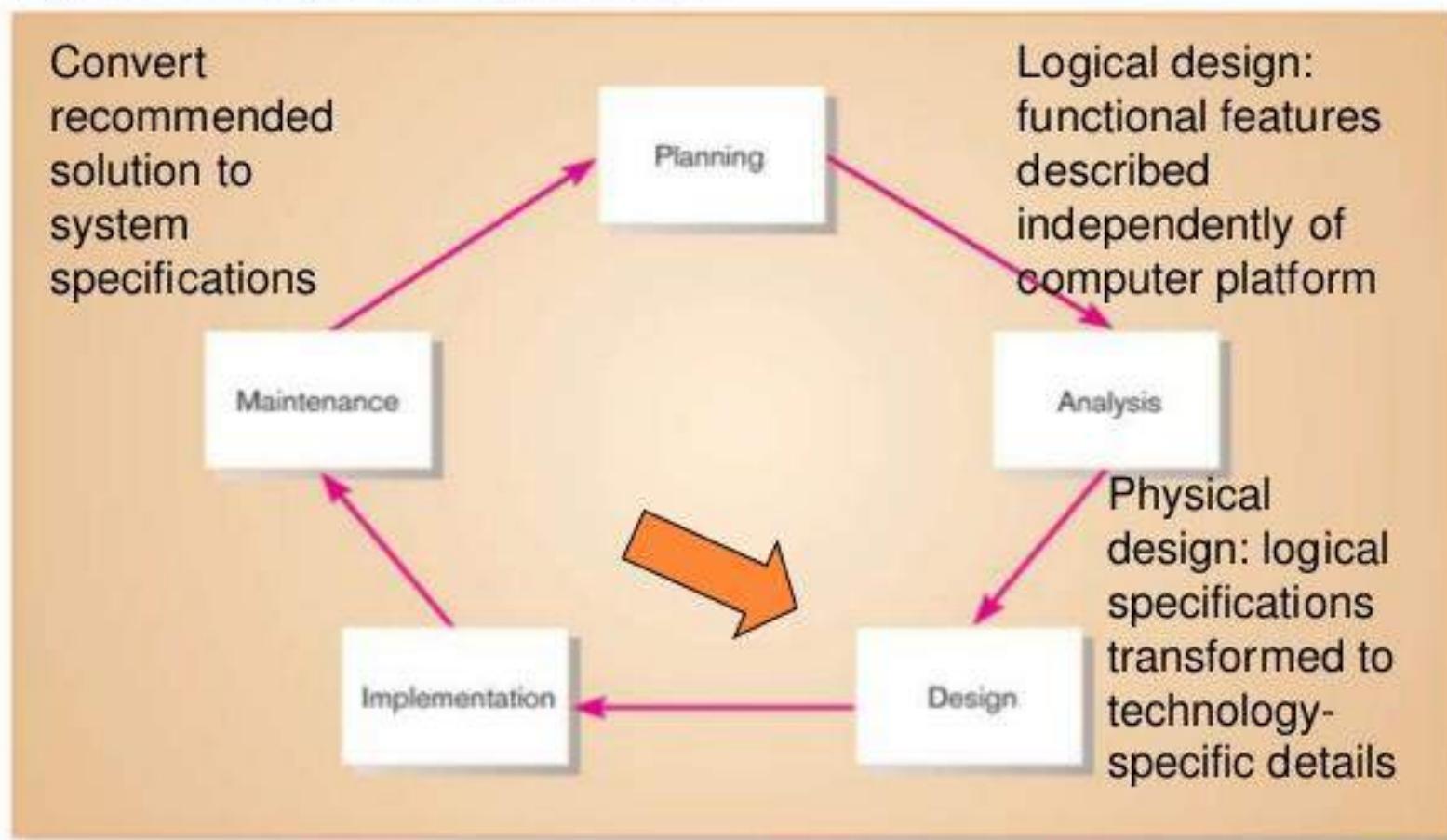
## DATA FLOW DIAGRAM(DFD)

- The data flow diagram is a powerful tool to understand the functional and information view of system.
- It can be two types – **Logical data flow diagram** and **Physical data flow diagram**
- Logical data flow diagram deals with the functional views of the system.

-  → Entity is represented.
-  → Curve like represents information flow from one entity (or) process (or) data store to another
- • → Two parallel lines represent data store.
- • → a process is represented by a circle.

# SDLC DESIGN PHASE

**Figure 1-3** The systems development life cycle



## DATA DICTIONARY(DD)

- The data dictionary is a complete and comprehensive definition of all the data element in the system.
- It is the source document for specifications of all inputs, protocols, outputs, data structures, database structures, meta data and algorithm.

## CONT.....

- A DD normally serves the following purpose:
  - A summary of the documentation
  - A tool to reduce redundant data
  - A background for I/O design
  - As a centralized control of all data in a system
  - As a controller of data integrity.

## Pitfalls of MIS

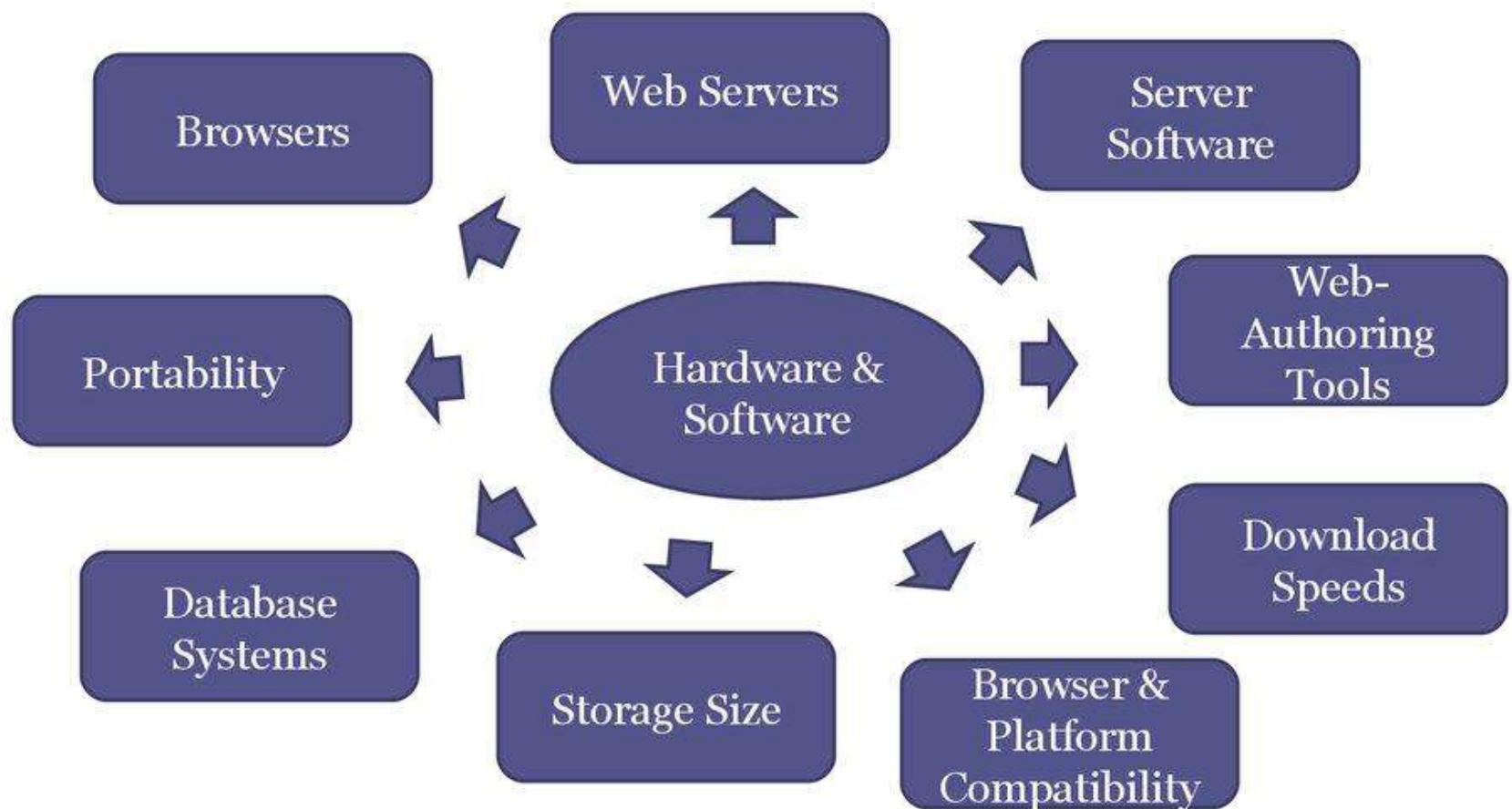
- Organization does not have a reliable management system .
- Organization has not defined its mission clearly.
- Organization's objectives have not been specified.
- Management lacks interest in MIS development process and relies solely on MIS development's specification.
- MIS development team is incompetent.

# Unit-4

# What is E-Business?

- E-business means using the Internet, other networks, and IT to support
  - Electronic commerce
  - Enterprise communications and collaboration
  - Web-enabled business processes
- E-commerce is the buying, selling, and marketing of products, services, and information over the Internet and other networks

# Technologies involved in e-Commerce





## Some common applications related to e-commerce

- Online shopping and Order tracking
- Electronic Tickets
- Social- networking
- Newsgroups
- Online Banking
- Teleconferencing
- Instant Messaging
- Domestic and International Payment Services.

## DECISION MAKING & INFORMATION SYSTEM

- Decisions are made at all levels of the firm.
- Some decisions are very common and routine but exceptionally valuable.
- IT provides new tools for managers to carryout decisions.
- Receiving the most concrete, up-to-date information and redistributing it to those who need to aware of it.
- IT does not provide any information directly, but provides some capabilities to the user to analyze the decision problem and generate some meaningful information for decision-making

# COMPONENTS AND STRUCTURE OF DSS

- **Data Management**

- Includes the database(s) containing relevant data for the decision situation

- **User Interface**

- Enables the users to communicate with and command the DSS

- **Model Management**

- Includes software with financial, statistical, management science, or other quantitative models

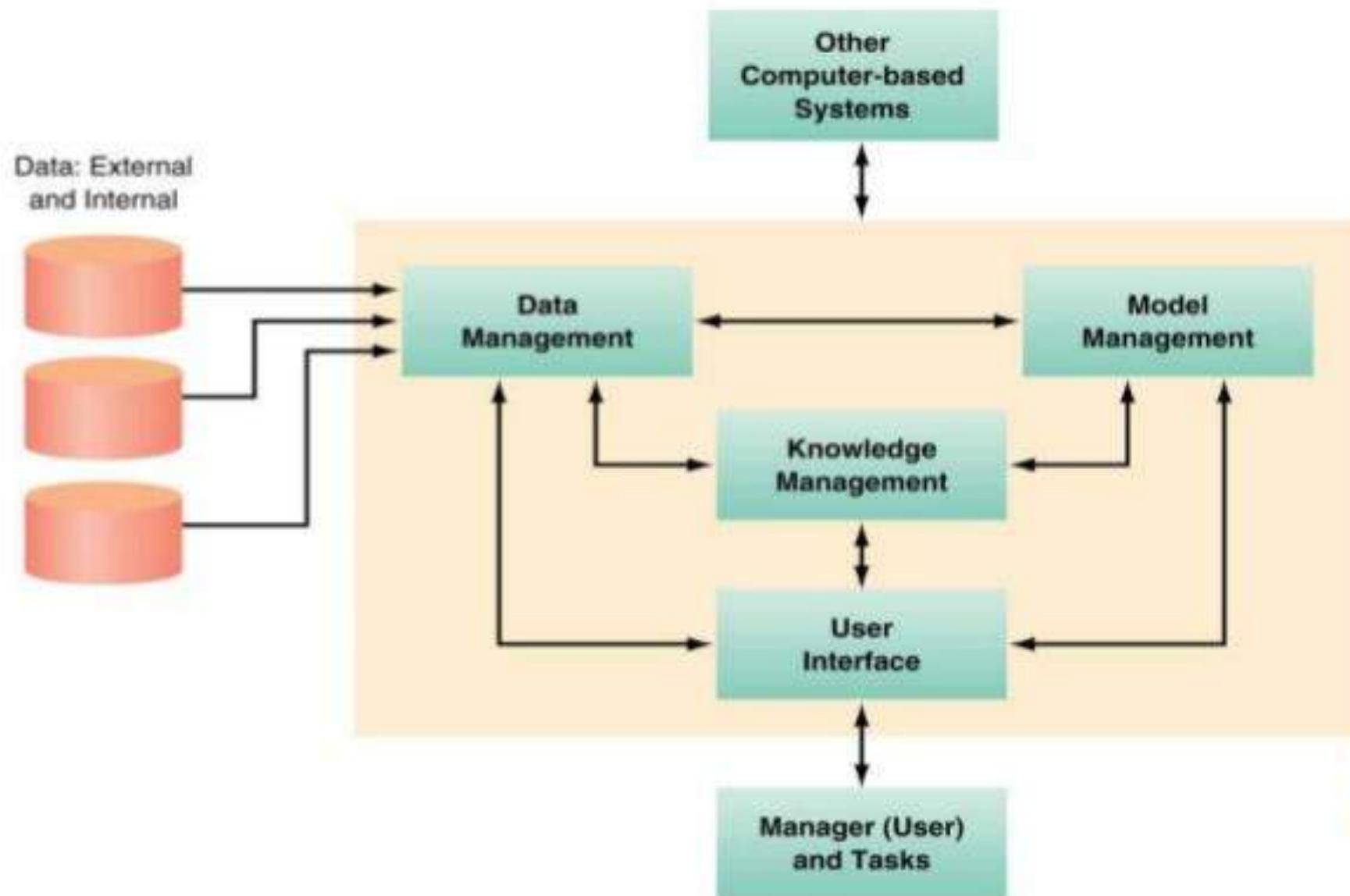
- **Knowledge Management**

- Provides knowledge for solution of the problem; supports any of the other subsystems or act as an independent component

# Objective of DSS-

- ❖ Identify information processing as the foundation of managerial work.
- ❖ Identify which media are more suitable for supporting managerial work
- ❖ Describe decision making/problem solving systems in Organizations
- ❖ Decision support content of different types of information systems.
- ❖ Differences in characteristics of Information Systems.
- ❖ Discuss models of decision making.
- ❖ Describe decision making process.

# COMPONENTS AND STRUCTURE OF DSS



## Decision Support Systems (DSS)

- A DSS is an organized collection of people, procedures, software, databases, and devices used to support problem-specific decision making.

- Examples:

- How will a labor strike affect our production schedule?
- What are the potential affects of Cap-and-Trade on our profits?
- Should we introduce a new line of clothing?
- Should we move into “green” tech?

