System Concepts

1.1 System Definition
1.2 Characteristics of a System : Organization, Subsystem, Interaction,
1.3 Interdependence, Integration, Central objective, Standards, Black-box Elements of a system Outputs, Inputs, Processor(s), Control, Feedback,
1.4 Environment, Boundaries, Interface
1.5 Physical & Abstract Systems
1.6 Open & Closed
1.7 Computer-based Systems : MIS ,DSS

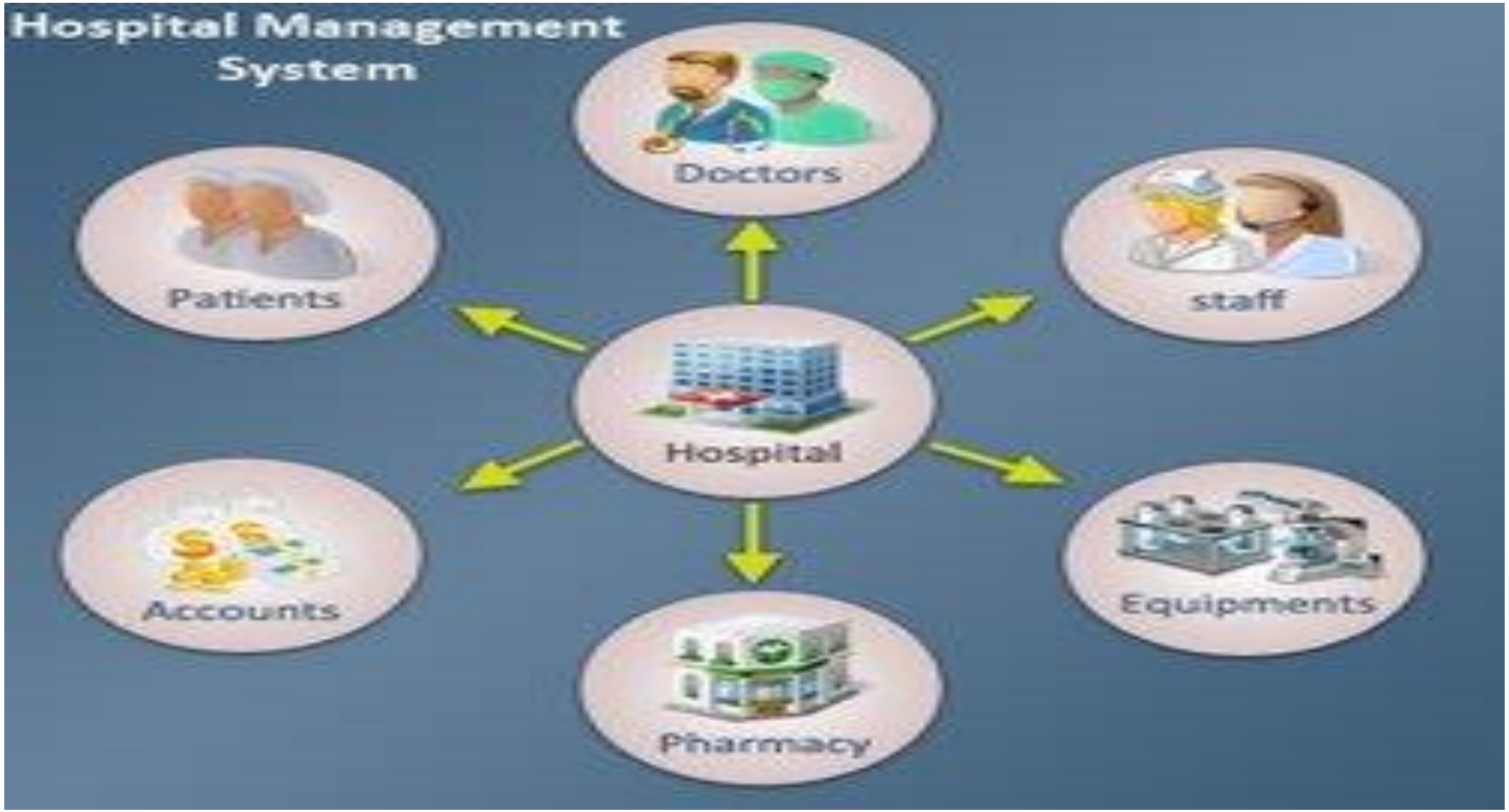
System Definition

System is a collection of interdependent subsystems or components that work towards a common goal.

Information Systems

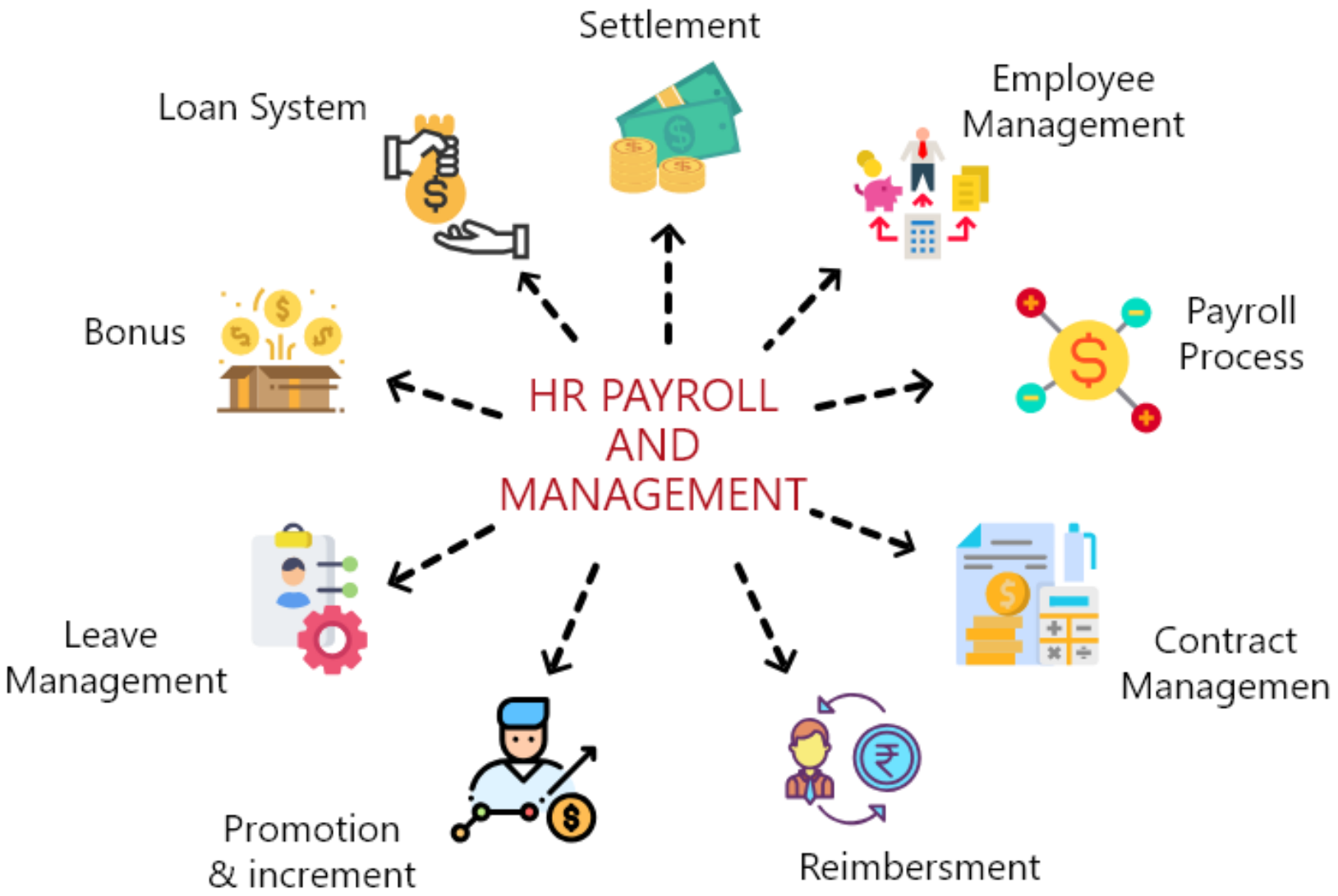
Information related to the system ,that describes the system completely is known as information system

Examples of systems



Transportation Management System

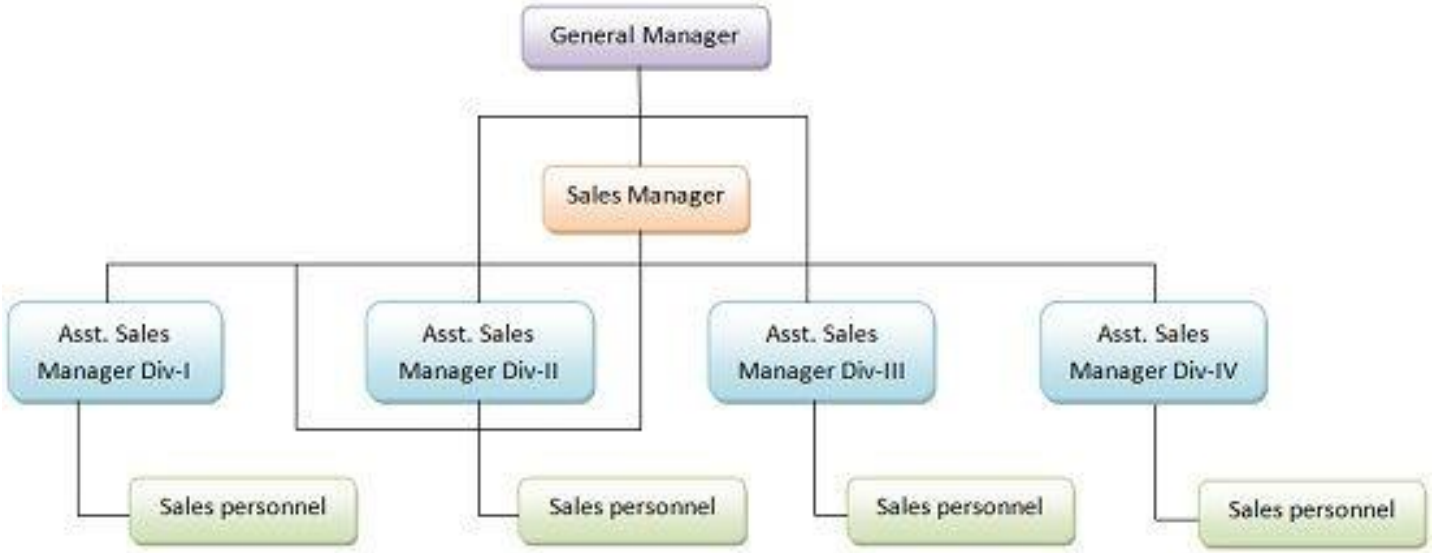
Employee Management System



Characteristics of a System

1)Organization

- ✓Definition: Organization refers to a collection of people, who are involved in pursuing defined objectives. It can be understood as a social system which comprises all formal human relationships. The organization encompasses division of work among employees and alignment of tasks towards the ultimate goal of the company.



Characteristics of a System

2) Subsystem

- ✓Subsystem are small parts of system
- ✓The subsystems are interdependent and can’t work without each others cooperation in the system
- ✓System could be well studied only if its subsystems are separately identified and their details are know in the depth.

Example : CEO, president ,Executive president, Team Lead are the components of company

Characteristics of a System

3) Interaction

- ✓Interaction refers to the manner in which each component functions with other components of the system in the organization.
- ✓Ex. Purchasing must interact with production, advertising with sales etc.

Characteristics of a System

4) Interdependence

- ✓ Interdependence refers to the dependence of the parts of the organization on one another.
- ✓ The system components are linked together as per the plan
- ✓ In many cases ,one subsystem may depend on the input of another subsystem for execution its own functions

Characteristics of a System

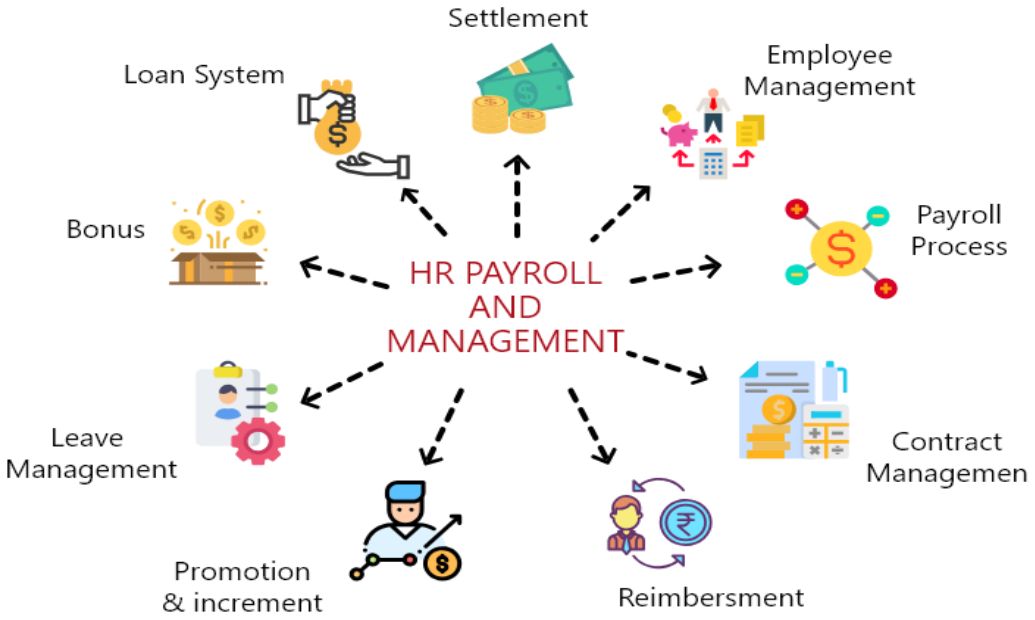
5) Integration

- ✓Integration describes how the system is tied together.
- ✓Every part of the system works within the system though their functions are unique or different

Characteristics of a System

6) Central objective

- ✓Objectives could be stated by organization
- ✓Software developer must be aware of the central objective of a computer application in the phase of an analysis for a successful design and conversion of design to the program

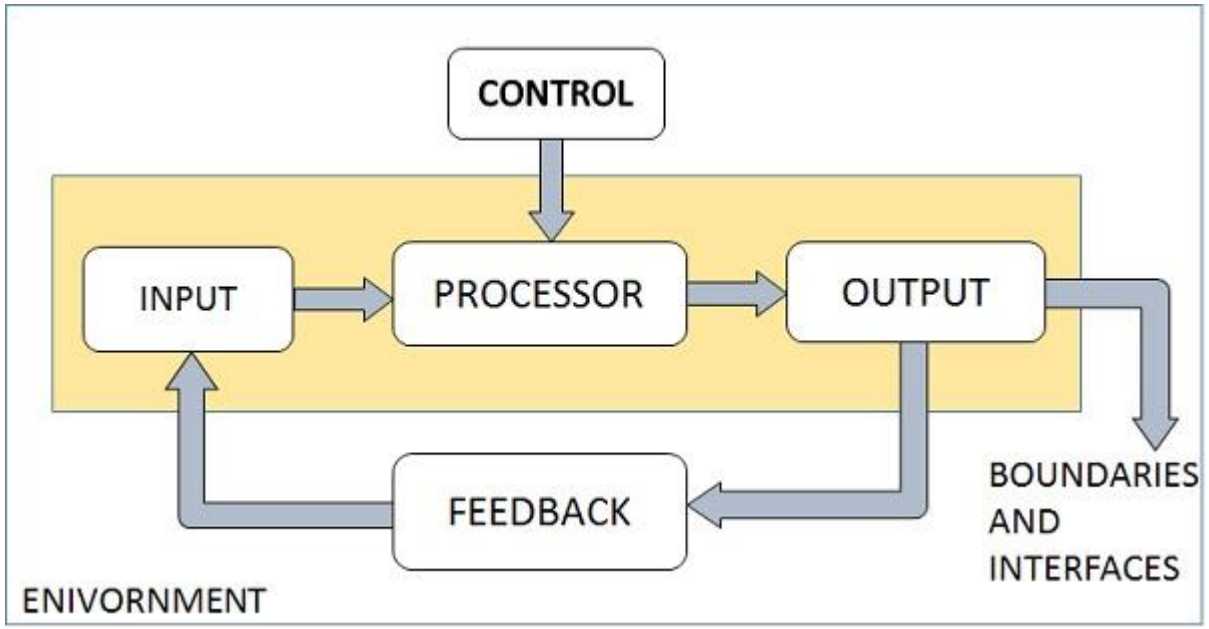


7) Standards

- ✓Standards are set of acceptable levels of the performance.
- ✓They are used to determine the difference between expected and actual performance of the system
- ✓Without standards it is difficult to find the performance of the system

Elements of the system

1)Outputs and Inputs
2)Processors
3)Control
4)Feedback
5)Environment
6)Boundaries and Interfaces



1) Input and output

- ✓A major objective of any system is to produce an output that is desired by the user. This output is valuable to the user and finally to the business
- ✓Input to the system can be material ,human resources or even information. The output should be in tune with the users expectations
- ✓Output could be goods , services or even information

2) Processors

- ✓Processor can be defined as an element that actually converts or transforms the system input to the system output
- ✓Processor is referred as an operational component of a system. Processor may change or modify the input completely or partially

3) control

- ✓The control element of the system is useful for guiding the system
- ✓Control is nothing but the decision making subsystem that controls the following aspects:
  1. Patterns of activities that governs the input
  2. Processing
  3. Output

4) Feedback

- ✓In dynamic systems or environments ,control can be achieved with the help of feedback.
- ✓Feedback is useful in measuring actual output against a standard output with the help of some procedures that involves communication and control

5) Environment

- ✓Environment is the source of external elements that have an influence on the system.
- ✓The organizations environment may include :

vendors,Competitors ,customers,bank,government,banks,stakeholders,economic indicators etc.

6) Boundaries and interfaces

- ✓ Boundaries are the limits that are used to identify its components ,process and interrelationships of a system when the same system interacts with another system
- ✓ Different systems can interact using interface provided to them.
- ✓ Ec. Through banks money could be transferred to other banks. Both the banks are different having different systems but they can interact with each other through some interface

- ✓ https://www.youtube.com/watch?v=8FgsrzfIt0A

Types of systems

There are various types of systems based on the nature of the system. The system could be classified in few common types

1) Physical or abstract
2) Open or closed

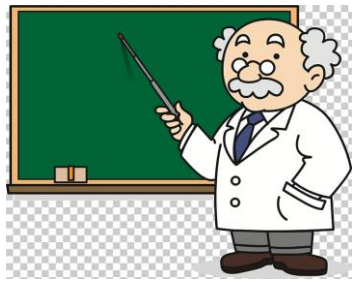
Physical system

- ✓ Physical systems are tangible entities that can be seen or moved. We can eve count it
- ✓ The example of physical systems could be physical parts of computer department. Physical parts could be office ,furniture .All the listed physical entities allow a computer department work smoothly.

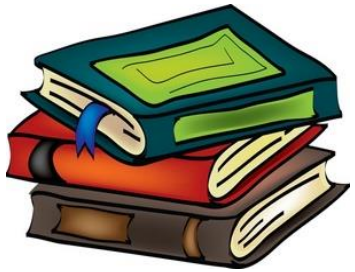
Abstract system

- ✓ Abstract systems are conceptual entities .It means that abstract system do not exist physically
- ✓ This system is an abstract conceptualization of physical situations .A model can be referred as a representation of planned or real system
- ✓ They may be formulas ,representation or model of a real system

Student

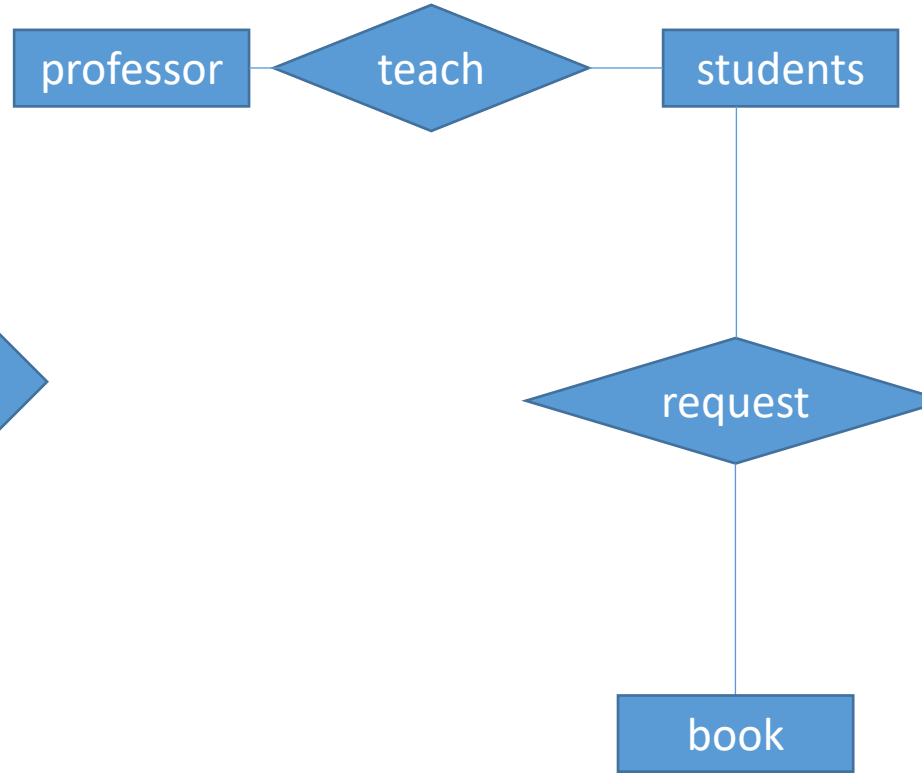


Professor



Books

Physical components of the system



Conceptual model /abstract system

Open system or closed system is a classification of systems done on the basis of degree of independence.

Open system

- ✓ An open system must interact with its environment. It receives inputs from and delivers outputs to the outside of the system
- ✓ Open system allows interaction across it boundary
- ✓ Theses systems should be able to adapt changes and changing requirements of the user.
- ✓ These systems are challenging for design and analysis

Closed System

- ✓ A closed system does not interact with its environment. It is isolated from environmental influences. A completely closed system is rare in reality.

Management Information Systems (MIS)

Management Information System (MIS) is one of the five major Computer Based Information Systems (CBIS). (Transaction processing, MIS, DSS, office automation, paperless automation such as AI, IOT etc.) Its purpose is to meet the general information needs of the managers in firm or organization. MIS is a computer based system that makes information available to users with similar needs.

Management: art of getting things done through and with the people of in formally organized groups. Managerial functions:

(i) Planning, (ii) Organizing, (iii) Staffing, (iv) Directing, (v) Controlling

Information: data that have a meaning with a context ,where data is raw facts about an entity (entity is the object of interest).

System: set of inter-related components with a clearly defined boundary working together to achieve a common goal.

Why MIS ?

It may be a student aspiring to become a manager in some organisation, an entrepreneur or a professional. Information system and information technology is a vital component of any successful business and is regarded as a major functional area like any other functional area of a business organization like marketing, finance, production, human resources (HR) etc.

Information systems play following 3 vital roles for a business organisation:

- Supports the business processes and operations of an organisation.
- Support of decision making by employees and managers of an organisation.
- Support the strategies of an organisation for competitive advantage.

Advantages of MIS ?

- Improves quality of an organization or an information content by providing relevant information for sound decision making.
- MIS change large amount of data into summarize form and thereby avoid confusion which may an answer when an information officer are flooded with detailed fact.
- MIS facilitates integration of specialized activities by keeping each department aware of problem and requirements of other departments.
- MIS serves as a link between managerial planning and control. It improves the ability of management to evaluate and improve performance.

Disadvantages of MIS ?

- Too rigid and difficult to adapt.
- Resistance in sharing internal information between departments can reduce the effectiveness.
- Hard to quantify benefit to justify implementation of MIS.
- Quality of output of an MIS is directly proportional to quality of input and processes.

Major System in an Organizational Systems:

Organizational information system are logical rather than physical way of thinking about MIS. The following are the management levels:

1. Strategic Planning Level: Plan
2. Management Control Level: Organize
3. Operational Control Level: Direct

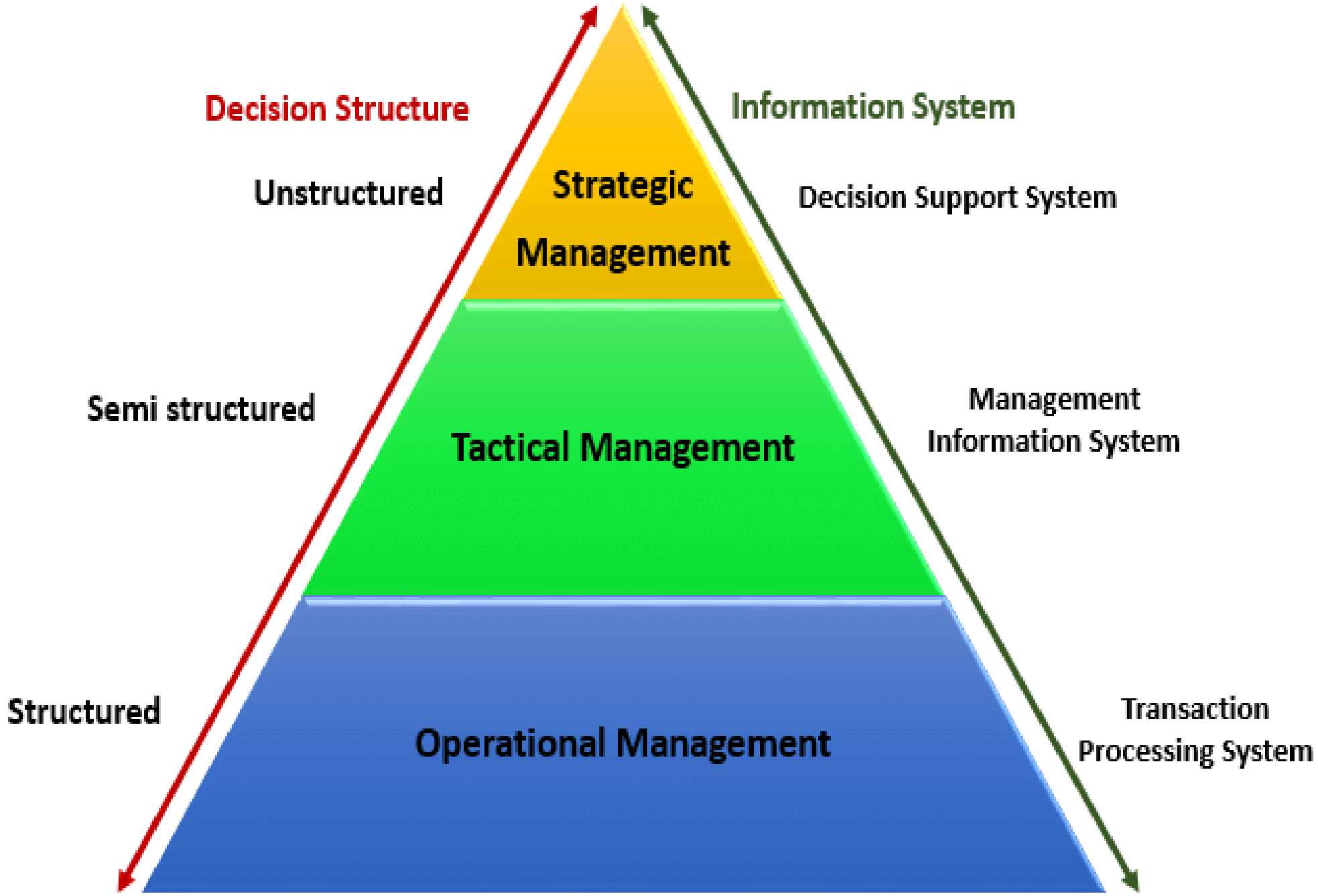
Operational Control

- Marketing: It is the area in which considerable effort as spent in describing how the computer could be applied to the entire range of marketing operations.
- Finance: It does not embrace title of financial information system although computer based information system in that area are common. For ex-payroll, taxation.
- Human Resource: It represents area where most current attention is being focused. Terms Human Resource Information System (HRIS), and Human Resource Management System (HRMS) are common.
- Manufacturing: It describes how the computer could be applied to the entire range of information collection.

Decision support system

DSS is an extension of capabilities of MIS .

Decision support systems are used by top level managers to make semi-structured decisions. The output from the Management Information System is used as input to the decision support system. DSS systems also get data input from external sources such as current market forces, competition, etc.


Decision Structure
Unstructured
Semi structured
Structured
Information System
Decision Support System
Management
Information System
Transaction
Processing System
Strategic
Management
Tactical Management
Operational Management