MBA : Sem-4

# Computer Application And Management Information System

# MB 402

## UNIT V – Management Information System (MIS)

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# System Concepts Continued..

Period : 07 ( 1hr.)

# System : Characteristics

- All types of systems have some fundamental characteristics. The common system characteristics are :

1. **Interdependence** – It is the dependency between system components to achieve an objective in a planned manner.
2. **Organisation –** It is the arrangement of system components that help to achieve business objectives. For example, in a college, the hierarchical relationships starting with the principal and leading downwards to the faculties, represent the college structure. Similarly, in a company, hierarchical relationship from MDs, their executives and others down the line, represent the company.

# System : Characteristics

3. **Integration** – It means how well a system is tied together i.e. all components of the system work together within the system, but each module or component performs a unique function. Goal is the central characteristic of every system. It states that what is actually required from the system and all users must be aware of it.
4. **interaction** (between components) – It means the procedure in which each subsystem works with other subsystems of the system. For example, employee payroll must interact with personnel system of any company.
5. **Central objective –** It is the overall goal(s), for whose achievement, the system has been created. Systems are basically goal-driven entities and every system must have some goals and objectives.

# System : Types

- Systems have been classified in many different ways. Common classifications are:

1. **Physical Systems and Abstract Systems :**

   **(a) Physical Systems** - Physical systems are concrete entities that may be static or dynamic in operation. For example, the tangible entities of a computer centre are the offices, tables and chairs that facilitate the operation of the computer centre. These entities can be seen or counted and are static. Contrary to this, programmed computer is a dynamic system. Data, programs, output and application change live change with the change in the users demands or the priority of information requests.

# System : types

**(b) Abstract Systems –** Unlike physical systems, Abstract systems are conceptual or non-physical entities.

They may be as simple as formulas of relationship between sets or variables or models — i.e., the abstract depiction of physical situations.

A model is a portraiture of a real or planned system. It is, by the use of the models that the analyst easily identifies the relationships in the system under study.

Systems analysis is the only field where models are essential and extensively used and with greater variety.

# System : Types

2. **Open Systems and Closed Systems** – This classification of systems is based on the extent of their independence. A system interacts with its environment through the interfaces located on the boundary.

   A system is said to be an open system if there exists interaction between the system and its environment.

   If there is no interaction of the system with its environment, the system is said to be a closed system.

   **It is nearly impossible to have a closed system. A system needs to interact with its environment.** In systems analysis, almost all systems are open systems, which get affected by their environment.

# System : Types

3. **Natural Systems and Man-made Systems –** Natural systems are products of evolution. For example the Solar System, the Human Body System etc.
   whereas Man-made systems are created by human beings to satisfy their specific needs.
   Man-made systems often mimic natural systems.
   For example, Information systems are one type of man-made systems which take information as input and provide desired information as output.
   Other examples of man-made systems are railway reservation system, employee payroll system, inventory control system, accounts receivable system, sales and order processing system, sales monitoring system etc.

# System : Basic Principles

- There are several fundamental concepts related to the system.
- These concepts direct the design of information systems.
- A key aspect of building systems is the system's relationship with its environment.
- The five major system concepts or principles that guide the good system design are as follows:
  - Decomposition
  - Simplification
  - Modularity
  - Coupling
  - Cohesion

# System : Basic Principles

- **Decomposition** – It deals with the ability to break down a complex information system into components.
- These components or subsystems can further be broken down into smaller subsystems depending upon their scope.
- The idea is to decompose a complex system in successive layers of simpler subsystems till the lower level systems are of manageable complexity.
- The functions of decomposition facilitate all the stakeholders by:
- Decomposing an information system into smaller manageable and comprehensible
- Allowing different components of a system to be built at independent times and by diverse

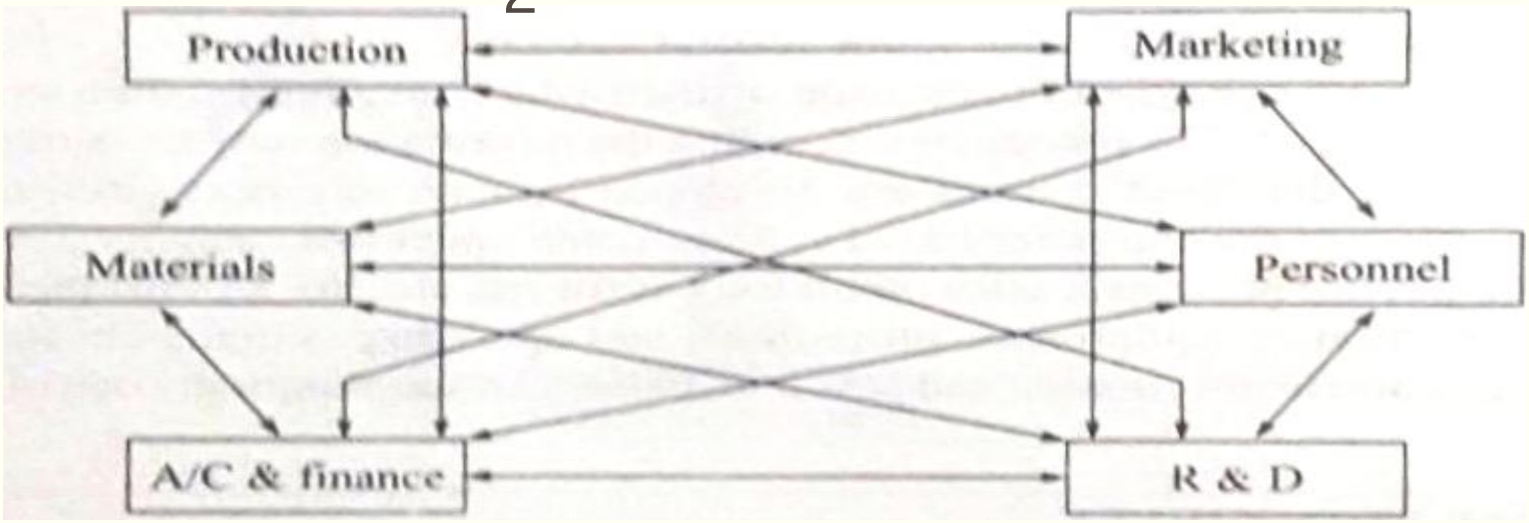
# System : Basic Principles

- **Simplification** – It is the process to simplify the interconnection between system components. A mathematical formula is used to identify such interconnections.
- It is the process of linking large number of components that has been decomposed (due to the decomposition process).
- This principle is the process of organizing subsystems so as to reduce number of interfaces between system components. If there are n subsystems, then the interfaces will determined by the following formula:

  Number of interfaces = $\frac{n(n-1)}{2}$

# System : Basic Principles

- For example, if an organisation is divided into six major subsystems, say, production, marketing, materials, accounts & finance, personnel and research & development, then for these six sub components the number of interfaces required will be : $\frac{6 \times (6 - 1)}{2} = 15$ interfaces



# System : Basic Principles

- **Modularity** – is to divide a system into modules of relatively uniform size. It is again a result of decomposition. These modules can represent the components of an information system making it not only more intelligible but also easier to rebuild.
- **Coupling** – is the extent to which components are dependent on each other. Coupling is the strength of interconnection between modules, or a measure of interdependence among subsystems or components. An attempt is made to loosely couple the components so that the interdependence can be reduced.

# System : Basic Principles

- **Cohesion –** is the extent to which a module performs a single or similar functions.
- Cohesion of a component or module or subsystem represents how the internal elements of a module are tightly bound to one another.
- For example, in the Natural System like biological systems, components are well demarcated and are thus very cohesive.
- But, in case of Man-made Systems, components are not always as cohesive as they should be.
- **In addition to these, two other key system concepts are:**
  - Logical system description
  - Physical system description

# System : Basic Principles

- **Logical system description** – It focuses on the system's role and aim without giving any consideration to how the system will be physically implemented.
- For example, in developing a logical description of a television, we describe the basic components of the television, i.e., its picture tube, controls, speakers and amplifier, and their relation to each other; thereby, focusing on the function of playing television.
- The cost of picture tube, speakers, amplifiers etc are not considered.

# System : Basic Principles

- **Physical system description –** is a material depiction of the system, with prime concern of building the actual system.
- A physical description of a television would provide details on the design of each subunit.
- Such as, the construction of the picture tube, digital architecture of the sound system, colour definition (HD or not) and whether the control features are digital etc.