

MANAGEMENT INFORMATION SYSTEM

UNIT-1

System:-

A system is an orderly grouping of interdependent components linked together according to a plan to achieve a specific goal.

Examples of System:-

1. Transportation System
2. Telephone System
3. Accounting System
4. Production System
5. Computer System
6. Business System, etc.

System Concepts:

1. Environment and boundaries

Systems theory views the world as a complex system of interconnected parts. One scopes a system by defining its boundary; this means choosing which entities are inside the system and which are outside—part of the environment. One can make simplified representations (models) of the system in order to understand it and to predict or impact its future behavior. These models may define the structure and behavior of the system.

2. Natural and human-made systems

Natural systems may not have an apparent objective but their behavior can be interpreted [by whom?] as purposeful by an observer. Human-made systems are made with variable purposes that are achieved by some action performed by or with the system. The parts of a system must be related; they must be "designed to work as a coherent entity" — otherwise they would be two or more distinct systems.

3. Theoretical framework

Most systems are open systems, exchanging matter and energy with its surroundings; like a car, a coffeemaker, or Earth. A closed system exchanges energy, but not matter, with its environment; like a computer or the project Biosphere. An isolated system exchanges neither matter nor energy with its environment. A theoretical example of such system is the Universe.

4. Process and transformation process

An open system can also be viewed as a bounded transformation process, that is, a black box that is a process or collection of processes that transforms inputs into outputs. Inputs are consumed; outputs are produced. The concept of input and output here is very broad.

5. System model

A system comprises multiple views. Man-made systems may have such views as concept, analysis, design, implementation, deployment, structure, behavior, input data, and output data views. A system model is required to describe and represent all these views.

6. Systems architecture

A systems architecture, using one single integrated model for the description of multiple views, is a kind of system model.

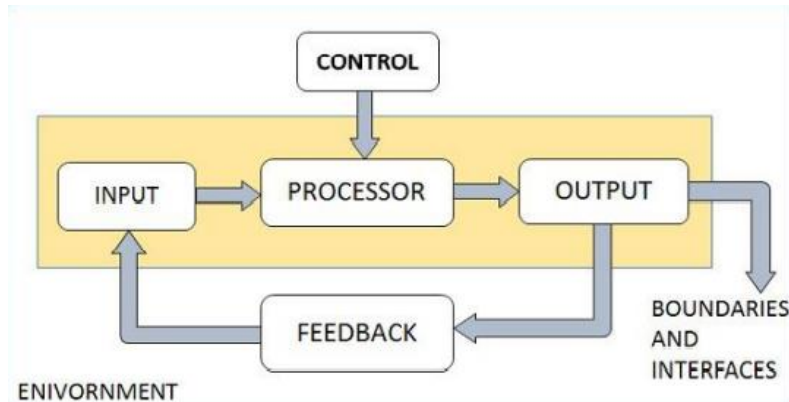
7. Subsystem

A subsystem is a set of elements, which is a system itself, and a component of a larger system.

A subsystem description is a system object that contains information defining the characteristics of an operating environment controlled by the system.

Components/Elements of a System:

1. **Input:** Input is what data the system receives to produce a certain output. Input involves capturing and assembling elements that enter the system to be processed.
2. **Output:** What goes out from the system after being processed is known as Output. Those elements that exist in the system due to the processing of the inputs.
3. **Processor:** The processor is the element of a system that involves the actual transformation of input into output. It is the operational component of a system.
4. **Control:** The control elements guide the system. It is the decision-making subsystem that controls the pattern of activities governing input, processing, and output.
5. **Feedback:** Feedback is the data about the performance of the system. Feedback measures output against a standard in some form of cybernetic procedure that includes communication and control.
6. **Boundary:** The boundaries are nothing but the limit of the system. Setting up boundaries helps for better concentration of the activities carried in the system.
7. **Interfaces:** The interconnections and the interactions between the sub-systems is known as the Interfaces. They may be inputs and outputs of the systems.
8. **Environment:** The things outside the boundary of the system are known as environment. Change in the environment affects the working of the system.



Types of system:

1. Open System:

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

2. Closed System:

- Shuns any kind of the exchange with the environment.
- Is rigid in nature.
- Is not at all amenable to the change.
- Is also self-contained.
- Is somewhat isolated in the nature.

3. Abstract System (Conceptual System):

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

4. Physical System (Empirical System):

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

5. Formal Information System:

It is based on the flow of information in the form of memos, instructions, etc., from top level to lower levels of management.

6. Informal Information System:

It is employee-based system which solves the day to day work related problems.

7. Computer Based System:

This system is directly dependent on the computer for managing business applications. For example, automatic library system, railway reservation system, banking system, etc.

8. Management Information System (MIS):

An MIS is a set of computer-based system and procedure implemented to help managers in their crucial job of decision making. The actual process will involve the collection, organization, distribution and storage of organization wide information for managerial analysis and control.

9. Decision Support System (DSS):

A key factor in a use of decision support system is determining what information is needed. DSS advances the capabilities of MIS. A DSS is an interactive computer-based system intended to help managers to make decisions. A DSS helps a manager to retrieve, summarize and analyze decision relevant to data.

10. Subsystems:

Smaller systems within the system or the components of a system are called subsystems.

11. Super Systems:

Super system is the whole complex of subsystems, or it denotes any extremely large and complex system.

Characteristics of a system:

1. **Organization:** It implies structure and order. It is the arrangement of components that helps to achieve objectives.
2. **Interaction:** Interaction refers to the manner in which each component functions with other components of the system.
3. **Interdependence:** Interdependence means that parts of the organization or computer system depend on one another. They are coordinated and linked together according to a plan.
4. **Integration:** Integration refers to the holism of system. And is concerned with how a system is tied together.
5. **Central Objective:** The objective of system must be central. It may be real or stated. It is not uncommon for an organization to state an objective and operate to achieve another.

System Approach:

The systems approach is an old concept. The approach stands on the assumption that breaking down of a complex concept into simple easy to understand units helps in better understanding of the complexity.

Major concepts of the systems approach:

Holism:

A change in any part/component of a system affects the whole system directly or indirectly.

Specialization:

A whole system can be divided into granular (smaller easy to understand) components so that the specialized role of each component is appreciated.

Non-summation:

Every component (subsystem/partial system) is of importance to the whole. It is therefore essential to understand the actions of each component to get the holistic perspective.

Grouping:

The process of specialization can create its own complexity by proliferating components with increasing specialization. To avoid this, it becomes essential to group related disciplines or sub-disciplines.

Coordination:

The grouped components and sub components need coordination. Without coordination the components will not be able to work in a concerted manner and will lead to chaos.

Coordination and control is a very important concept in the study of systems as without this we will not be a unified holistic concept.

Emergent properties:

This is an important concept of systems approach. It means that the group of interrelated entities has properties as a group that is not present in any individual component.

INFORMATION SYSTEM

Data:

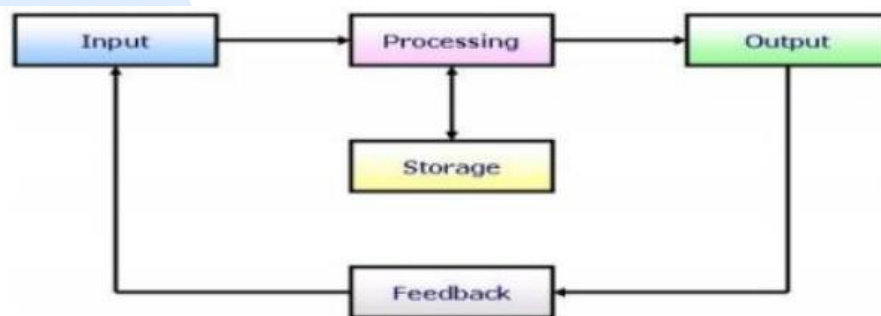
Data is raw facts. Data is like raw material. Data does not interrelate and also it does not help in decision making. Data is defined as groups of nonrandom symbols in the form of text, images, voice representing quantities, action and objects.

Information:

Information is the product of data processing. Information is interrelated data. Information is equivalent to finished goods produced after processing the raw material. The information has a value in decision making.

Information System:

An information system can be defined as a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making, coordination and control in an organization.



Information System

Characteristics of information system:

- It is used to collect, store and incorporate data.
- It can be a formal system, when you use computer-based means or solid structures to achieve the goal or objective, or an informal system, when you use more elementary or handcrafted structures, such as a pencil and paper.
- Stores qualitative information (non-numerical information) and quantitative information (numerical variables).
- It consists of data that is entered manually or automatically to create a database.
- Use surveys, questionnaires, field observations, censuses, or investigations to obtain data.
- It must be evaluated and measured to be updated or to correct possible errors.

- It must be secure to prevent the information collected from being lost or stolen.
- It requires some type of feedback; this means that the information leaves the system and re-enters with more elaboration or with more information.

Types of information:

1. Conceptual information

Conceptual information comes from ideas, theories, concepts, hypotheses and more. With conceptual information, an abstract idea is not always rooted in a scientific foundation and rather is the fundamental creation of beliefs, thoughts, philosophies and preferences.

Examples:

- Charles Darwin's theory of evolution
- Copernican concept of astronomy

2. Procedural information

Procedural information, or imperative knowledge, is the method of how someone knows to do something and is used by performing a task. You can refer to it as muscle memory since it is knowledge that is hard to explain and stored deeply in your mind.

3. Policy information

Policy information focuses on decision-making and the design, formation and selection of policies. It comprises laws, guidelines, regulations, rules and oversight for an organization, group of people or place.

Examples:

- Food pyramid diagram
- Periodic table of elements

4. Stimulatory information

Stimulatory information is information that creates a response or stimulation amongst a person or group of people. Stimulation encourages the cause of activity and you can gain stimulatory information in a variety of ways, like in person through observation, through word-of-mouth communication or through outlets like the news.

Examples:

- Victory day celebrations after a sports team wins a championship
- The physiological fight-or-flight reaction response to perceived harm

5. Empirical information

Empirical information means information gained through human senses, observation, experimentation and the testing of a hypothesis by establishing documentation of patterns or behavior. It almost always has a scientific foundation and verifies the truth or falsehood of a claim through qualitative and quantitative factors.

Examples:

- Atomic theory
- Theory of gravity

6. Directive information

Directive and descriptive information is about providing directions to a person or group of people to achieve a particular result and outcome. Directive information often comes in verbal or written form and can apply to leadership at work, in the military or government and with everyday experiences, like legal, life and safety matters.

Examples:

- Organ donation paperwork
- Coaching

Role of Information in Decision-making:

Information plays a vital role in decision-making. Even to take very simple decisions, we need information. To understand the role played by information in decision-making, we have to understand how decisions are taken. Decision-making is basically a process that includes the following stages:

Stages of Decision-making	Role of Information
Identification and structuring of problem/opportunity	One needs information to identify a problem and put it in a structured manner. Without information about a problem or opportunity, the decision-making process does not even start.
Putting the problem/opportunity in context	Without information about the context in which the problem has occurred, one cannot take any decision on it. In a way, the information about the context defines the problem.
Generation of alternatives	Information is a key ingredient in the generation of alternatives for decision-making. One has to have information about possible solutions to generate alternatives.
Choice of best alternative	Based on the information about the suitability of the alternatives, a choice is made to select the best alternative.

Types of information system:

1. Transaction Processing System (TPS):

- Transaction Processing System are information system that processes data resulting from the occurrences of business transactions
- Their objectives are to provide transaction in order to update records and generate reports i.e to perform store keeping function
- The transaction is performed in two ways: **Batching processing** and **Online transaction processing**.
- **Example:** Bill system, payroll system, Stock control system.

2. Management Information System (MIS):

- Management Information System is designed to take relatively raw data available through a Transaction Processing System and convert them into a summarized and aggregated form for the manager, usually in a report format. It reports tending to be used by middle management and operational supervisors.
- Many different types of report are produced in MIS. Some of the reports are a summary report, on-demand report, ad-hoc reports and an exception report.
- **Example:** Sales management systems, Human resource management system.

3. Decision Support System (DSS):

- Decision Support System is an interactive information system that provides information, models and data manipulation tools to help in making the decision in a semi-structured and unstructured situation.
- Decision Support System comprises tools and techniques to help in gathering relevant information and analyze the options and alternatives, the end user is more involved in creating DSS than an MIS.
- **Example:** Financial planning systems, Bank loan management systems.

4. Experts System:

- Experts systems include expertise in order to aid managers in diagnosing problems or in problem-solving. These systems are based on the principles of artificial intelligence research.
- Experts Systems is a knowledge-based information system. It uses its knowledge about a specify are to act as an expert consultant to users.
- Knowledgebase and software modules are the components of an expert system. These modules perform inference on the knowledge and offer answers to a user's question