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Systems development is systematic process which includes phases such as planning, analysis, design, deployment, and maintenance. Here, in this tutorial, we will primarily focus on –

- Systems analysis
- Systems design

## Systems Analysis

It is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components.

System analysis is conducted for the purpose of studying a system or its parts in order to identify its objectives. It is a problem solving technique that improves the system and ensures that all the components of the system work efficiently to accomplish their purpose.

Analysis specifies what the system should do.

## Systems Design

It is a process of planning a new business system or replacing an existing system by defining its components or modules to satisfy the specific requirements. Before planning, you need to understand the old system thoroughly and determine how computers can best be used in order to operate efficiently.

System Design focuses on how to accomplish the objective of the system.

System Analysis and Design (SAD) mainly focuses on –

- Systems
- Processes
- Technology

## What is a System?

The word *System* is derived from Greek word *Systema*, which means an organized relationship between any set of components to achieve some common cause or objective.

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

### **Constraints of a System**

A system must have three basic constraints –

- A system must have some **structure and behavior** which is designed to achieve a predefined objective.
- 
- **Interconnectivity and interdependence** must exist among the system components.
- 
- The **objectives of the organization** have a **higher priority** than the objectives of its subsystems.
- 

For example, traffic management system, payroll system, automatic library system, human resources information system.

### **Properties of a System**

A system has the following properties –

#### **Organization**

Organization implies structure and order. It is the arrangement of components that helps to achieve predetermined objectives.

#### **Interaction**

It is defined by the manner in which the components operate with each other.

For example, in an organization, purchasing department must interact with production department and payroll with personnel department.

#### **Interdependence**

Interdependence means how the components of a system depend on one another. For proper functioning, the components are coordinated and linked together according to a specified plan. The output of one subsystem is the required by other subsystem as input.

#### **Integration**

Integration is concerned with how a system components are connected together. It means that the parts of the system work together within the system even if each part performs a unique function.

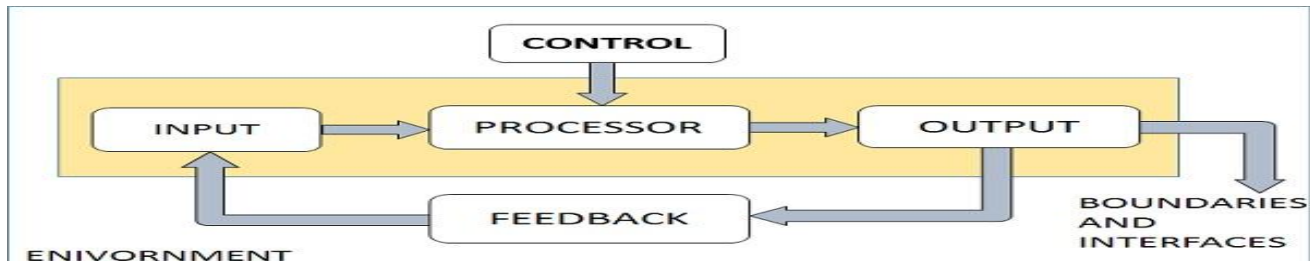
#### **Central Objective**

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.

The users must know the main objective of a computer application early in the analysis for a successful design and conversion.

## Elements of a System

The following diagram shows the elements of a system –



### Outputs and Inputs

- The main aim of a system is to produce an output which is useful for its user.
- Inputs are the information that enters into the system for processing.
- Output is the outcome of processing.

### Processor(s)

- 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. Processors may modify the input either totally or partially, depending on the output specification.
- As the output specifications change, so does the processing. In some cases, input is also modified to enable the processor for handling the transformation.

### Control

- The control element guides the system.
- It is the decision-making subsystem that controls the pattern of activities governing input, processing, and output.
- The behavior of a computer System is controlled by the Operating System and software. In order to keep system in balance, what and how much input is needed is determined by Output Specifications.

### Feedback

- Feedback provides the control in a dynamic system.
- Positive feedback is routine in nature that encourages the performance of the system.
- Negative feedback is informational in nature that provides the controller with information for action.

### Environment

- The environment is the “supersystem” within which an organization operates.
- It is the source of external elements that strike on the system.
- It determines how a system must function. For example, vendors and competitors of organization’s environment, may provide constraints that affect the actual performance of the business.

### Boundaries and Interface

- A system should be defined by its boundaries. Boundaries are the limits that identify its components, processes, and interrelationship when it interfaces with another system.

- Each system has boundaries that determine its sphere of influence and control.
- The knowledge of the boundaries of a given system is crucial in determining the nature of its interface with other systems for successful design.

## Types of Systems

The systems can be divided into the following types -

### Physical or Abstract Systems

- Physical systems are tangible entities. We can touch and feel them.
- Physical System may be static or dynamic in nature. For example, desks and chairs are the physical parts of computer center which are static. A programmed computer is a dynamic system in which programs, data, and applications can change according to the user's needs.
- Abstract systems are non-physical entities or conceptual that may be formulas, representation or model of a real system.

### Open or Closed Systems

- An open system must interact with its environment. It receives inputs from and delivers outputs to the outside of the system. For example, an information system which must adapt to the changing environmental conditions.
- A closed system does not interact with its environment. It is isolated from environmental influences. A completely closed system is rare in reality.

### Examples of Closed System

1. Air Conditioners
2. Boiling Soup in a Closed Lid Saucepan
3. Electric Hair Straightener
4. Sewing Machine
5. Watches and Clocks
6. Closed Lid Container
7. Piston Cylinder Arrangements without Valve
8. Rankine Cycle
9. Incandescent Light Bulb
10. Mixer or Blender
11. Pressure Cooker

### Adaptive and Non Adaptive System

- Adaptive System responds to the change in the environment in a way to improve their performance and to survive. For example, human beings, animals.
- Non Adaptive System is the system which does not respond to the environment. For example, machines.

### Permanent or Temporary System

- Permanent System persists for long time. For example, business policies.
- Temporary System is made for specified time and after that they are demolished. For example, A DJ system is set up for a program and it is dissembled after the program.

### Natural and Manufactured System

- Natural systems are created by the nature. For example, Solar system, seasonal system.

- *Manufactured System is the man-made system. For example, Rockets, dams, trains.*

### **Deterministic or Probabilistic System**

- *Deterministic system operates in a predictable manner and the interaction between system components is known with certainty. For example, two molecules of hydrogen and one molecule of oxygen makes water.*
- *Probabilistic System shows uncertain behavior. The exact output is not known. For example, Weather forecasting, mail delivery.*

### **Social, Human-Machine, Machine System**

- *Social System is made up of people. For example, social clubs, societies.*
- *In Human-Machine System, both human and machines are involved to perform a particular task. For example, Computer programming.*
- *Machine System is where human interference is neglected. All the tasks are performed by the machine. For example, an autonomous robot.*

### **Man-Made Information Systems**

- *It is an interconnected set of information resources to manage data for particular organization, under Direct Management Control (DMC).*
- *This system includes hardware, software, communication, data, and application for producing information according to the need of an organization.*
- *Man-made information systems are divided into three types –*
- **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.*
- **Informal Information System** – *This is employee based system which solves the day to day work related problems.*
- **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.*

## **What Is Interpersonal Communication?**

*Interpersonal communication is exchanging information, meaning, feelings, and opinions between two or more people via verbal and non-verbal means. Although we mentioned “face-to-face” communication previously, today’s technology compels us to expand its definition to include media such as phone calls and online messaging.*

## **What About Intrapersonal Communication?**

*You may have heard the term “intrapersonal communication” and wondered if it’s related to interpersonal communication. The words are opposites, actually. “Inter” refers to dealings between people, groups, or other entities (e.g., intercontinental, international). “Intra,” on the other hand, describes actions within a person or a group. For example, an intranet is a private digital network that exists solely within a company or organization.*

## Types of Interpersonal Communication

The first step in answering “what is interpersonal communication?” is breaking it down into four distinct types.

- **Verbal:** In other words, speaking. This term covers the words you use, how persuasively you speak, the language you use, which words you emphasize, and even the use of affirmative sounds and short phrases like “Yup” or “Uh-huh.”
- **Listening:** You can make a good case for listening as the most important interpersonal **communication skill**. It covers the ability to listen attentively, whether you’re using your ears to listen “in-person” or some other means, say, over the Internet. Listening also includes special techniques like reflection and clarification. The best listeners are people who can focus their attention on the speaker to make the latter feel like they’re the sole and most important person in the room.
- **The Written Word:** Thanks to the Internet age and situations requiring isolation (e.g., the pandemic), good written communication skills have become an asset. Whether you’re on social media, in the workplace, or even texting on your phone, you must know how to get your point across in writing. This type includes emojis, grammar, clarity, tone, and even punctuation. After all, there’s a vast difference between “Let’s eat, Grandma!” and “Let’s eat Grandma!”
- **Non-Verbal:** This final type covers body language, facial expressions, tone of voice, and gestures. Again, it’s essential that the listener picks up and correctly interprets non-verbal cues.

**Note:** - Information System topic is covered in previous notes so you can learn with this.

Thank You  
Have A Good Exam