This unit intends to acquaint you with system development and the various phases associated with the life cycle of the system development.



Automation
The act of implementing the control of equipment with advanced technology

2.3 THE SYSTEM DEVELOPMENT LIFE CYCLE (SDLC)

In this age of computer, automation is preferred everywhere rathar than manual system. For this, some standard and structural procedure or methodology is to be introduced in the organization so that the transition from manual to automated system becomes easy. The concept of *System Development Life Cycle*, in short SDLC has come into existence as a result of the transition from the manual system to automation.

Just as all living beings follow a life cycle, systems also follow a life cycle. The System Development Life Cycle is the set of activities that analysts, designers and users carry out to develop and implement an information system. The system analyst gives a system development project meaning and direction. A system development project begins with a decision to analyse user requirements. The project is completed once a usuable software product is produced and implemented and released. The SDLC is a systematic process for developing software that ensures the quality and correctness of the software product. This process tries to produce a high-quality software product so that it meet with custermers expectation.

The process of software development that starts with the requirement analysis, design, development of software and implementation, and continues through the system testing, evaluation and maintenance of the system, is called the ***System Development Life Cycle****.*

2.4 PHASES OF SDLC

The entire System Development Life Cycle can be divided into different phases of development such as:

- Recognition of Need
- Feasibility Study

requirements. It is the arrangement of components of a system for objectives.

b) **Interaction**: It defines the interactions between the components of a system. For example, in the computer system, the input, data, and process complements are interacted among themselves to produce the outputs.

c) **Interdependence**: It defines the dependencies of one component to other components in a system. It also shows the linkage between the components.

d) **Integration**: It explains how different subsystems are tied together to form a large-scale system. Those subsystems or components are integrated to achieve the objectives of the system.

e) **Central Objectives**: Though a system consists of many subsystems, and components, it always produces a unit and central objectives.

1.5 ELEMENTS OF SYSTEM

As mentioned above, a system has different components and elements. The followings are the elements of a system.

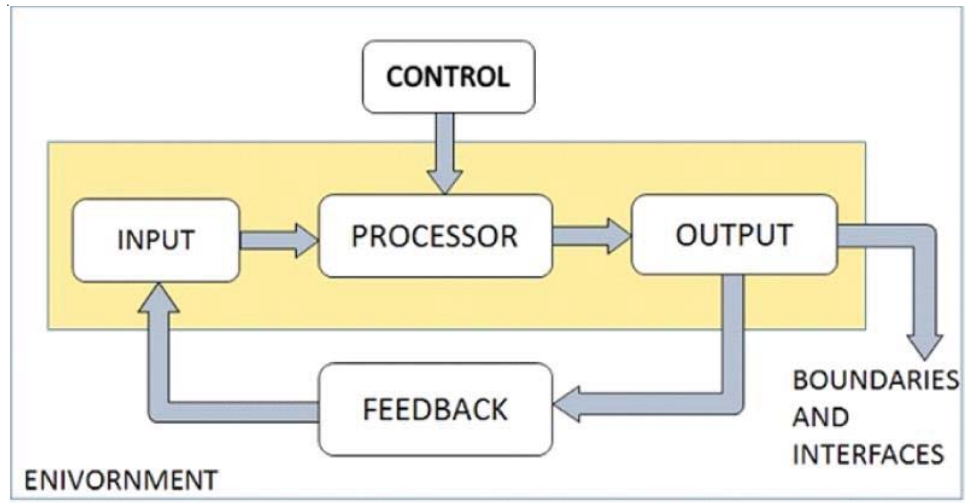


Figure 1.1: Components of System

i) Components: A component is one of the important elements of a system. It can be also considered as a subsystem. Because each component may be also a system. Different components form a system.

ii) Interrelated components: A system may have different components, that may have interrelation among them.

iii) Boundary: The boundary defines the outer line of a system that differentiates a system from the environment. It shows the inner and outerlines of a system.

iv) Purpose: It defines the final aim of a system, that must have some objectives. Every system should have a purpose, aim, and objectives.

v) Environment: Apart from a system, everything external that interacts with the system, is known as the environment.

vi) Interfaces: It is the point area where a system touches the environment or a subsystem meets another subsystem.

vii) Constraints: A limit to what a system can accomplish.

viii) Input: The information or data or fact that enters into the system for processing, is known as input.

ix) Output: The main objective of a system is to get an output that is helpful for its user. Output is the outcome of processing.



CHECK YOUR PROGRESS

Q 1: What do you mean by a system?

Q 2: What are the system components?

Q 3: Define two characteristics of a system.

Q 4: System Study involves identifying current deficiencies and establishing new goals (State whether True or False)

Q 5: System Study involves the study of an existing system (State whether True or False)

1.6 TYPES OF SYSTEM

The followings are the types of a system:

i) **Physical and Abstract Systems**: The physical systems are perceptible units. One can touch and feel them. A physical system

UNIT 2 : SYSTEM DEVELOPMENT LIFE CYCLE

UNIT STRUCTURE

2.1 Learning Objectives
2.2 Introduction
2.3 The System Development Life Cycle (SDLC)
2.4 Phases of SDLC
- 2.4.1 Recognition of Need
- 2.4.2 Feasibility Study
- 2.4.3 Requirement Analysis
- 2.4.4 Design
- 2.4.5 Development
- 2.4.6 System Testing
- 2.4.7 Implementation
- 2.4.8 Maintenance

2.5 System Documentation
2.6 Let Us Sum Up
2.7 Further Reading
2.8 Answers to Check Your Progress
2.9 Model Questions

2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to –

- learn various phases of System Development Life Cycle
- learn how a system can be developed following various phases
- identify different task in each phases of system development
- describe system documentation

2.2 INTRODUCTION

Previous unit is about system and its characteristics. Various elements associated with a system are descibed in the unit. We have also been familiarized with the types of system like physical, abstract open, and closed system. are also discussed.

Ans. to Q No 5: True

Ans. to Q No 6: A system that does not interact with its environment, is known as a closed system.

Ans. to Q No 7:

a. An Open system interacts with its environment.

b. The open system shares information with the environment.

Ans. to Q No 8: Adaptive systems are adaptive. To improve the performance and survive, the system adopts the changes with the environment. For example, a human being can adopt new things to survive and for a better life. A non-Adaptive System is a system that does not respond to the environment. For example, machines.

Ans. to Q No 9: The physical systems are perceptible units. One can touch and feel them. A physical system may be static or dynamic. For example, in the Computer system, the keyboard, mouse, monitor, etc. are the physical parts of the computer center, that are static

Ans. to Q No 10: True

Ans. to Q No 11: False

Ans. to Q No 12: False



1.10 MODEL QUESTIONS

Q 1: What is a system?

Q 2: What are the characteristics of a system?

Q 3: Why do we need to design a system?

Q 4: What is a large-scale system?

Q 5: What are the components of asystem?

Q 6: What are the types of systems?

Q 7: What is the difference between open and closed system?

Q 8: What is the difference between adaptive and non-adaptive systems?

Q 9: Explain about autonomous robot system.

*** ***** ***

may be static or dynamic. For example, in the computer system, the keyboard, mouse, monitor, etc. are the physical parts of the computer, that are static. But a software or a program is a dynamic system, that produces different outputs based on the user requirements and user's needs. An abstract system is a non-physical unit or conceptual thing, that has to formulate, to form a real system.

ii) **Open and Closed Systems**: A system that interacts with its environment, known as open system. It receives inputs and delivers outputs to the outside of the system. It is a process that exchanges information with its environment. For example, information systems. A system that does not interact with its environment, is known as a closed system. It is isolated from environmental parameters. A completely closed system is rare in reality.

iii) **Adaptive and Non-Adaptive System**: Adaptive systems are adaptive in nature. To improve the performance and survive, the system adopts the changes with the environment. For example, a human being can adopt new things to survive and for a better life. A non-adaptive system does not respond to the environment. For example, machines.

iv) **Permanent or Temporary System**: A permanent system is built for the long term and it persists for long time objectives. For example, business policies. A temporary system is made for a short goal, and then it is demolished. It is only used for short-term objectives or requirements. For example, a DJ system is set up for a program and it is dissembled after the program.

v) **Natural and Manufactured System**: Nature creation and its system is known as the natural system. For example, the Solar system. The man-made system or machine-based system is manufactured. For example, Rockets, buses, etc.

vi) **Deterministic or Probabilistic System**: Deterministic systems determine the objective based on the interaction between the system components in a predictable manner. For example, different steps

are combined to create an algorithm. A probabilistic system shows uncertain comportment of the components of the system. The precise output of the system is not known to anyone. For example,the probability of happening of ludo dice.

vii) **Social System**: It is made up of people for sharing information, thoughts, etc. For example, social clubs. In Human Social Machine System, both machines and humans are involved to perform a particular task. For example, computer programming, machine system. All the tasks are performed by the machine. For example, an autonomous robot.



CHECK YOUR PROGRESS

Q 6: What is a closed system?

Q 7: State two properties of an open system.

Q 8: Difference between adaptive and nonadaptive systems?

Q 9: What is a physical system?

Q 10: The Robotics system is a social system (True or False).

Q 11: Rocket is a natural system (True and False)

Q 12: The machine is an adaptive system (True or False)



1.7 LET US SUM UP

- A system is a group of related modules or parts or elements that work together. Interacting, interrelated, or interdependent elements are together known as systems.
- A computer system means a digital processing device. It is a collection of technologies, to serves the users, based on the set of requirements.
- All the types of the system have some components that work together to serve the user to fulfill the requirements.
- In a computer system, the input, data, and process are interacting among themselves to produce the outputs.

- In a Computer system, the keyboard, mouse, monitor, etc. are the physical parts of the computer center, that are static.
- A system that interacts with its environment, knowns open system.
- A system that does not interact with its environment, is known as a closed system.
- The machine is a non-adaptive system.
- A DJ system is set up for a program and it is dissembled after the program. So, it is a temporary system.
- Rockets, buses, etc. are the manufactured system.
- The probability of happening of ludo dice is the probabilistic system.
- An autonomous robot is a social system.



1.8 FURTHER READING

1. https://www.tutorialspoint.com/system_analysis_and_design/system_analysis_and_design_overview.htm.



1.9 ANSWERS TO CHECK YOUR PROGRESS

Ans. to Q No 1: A system is a group of related modules or parts or elements that work together. Interacting, interrelated, or interdependent elements are togetherly known as systems.

Ans. to Q No 2: The followings are the components of a computer system.

a. Input
b. Processing
c. Output
d. Memory
e. Communication devices

Ans. to Q No 3: A complete system must have the following characteristics.

a. Organization.
b. Interaction

Ans. to Q No 4: True