

Final Assessment | Summer 2023

Md. Shafayet Hossain

CSE - 21st Batch | Course Title: System Analysis & Design

Course Code: CSI - 311 | ID: 2121210071

Answer to the Question no- 1

System Design

System design is the phase that bridges the gap between problem domain and the existing system in a manageable way. This phase focuses on the solution domain, i.e. "how to implement?"

It is the phase where the SRS document is converted into a format that can be implemented and decides how the system will operate.

In this phase, the complex activity of system development is divided into several smaller sub-activities, which coordinate with each other to achieve the main objective of system development.

Differences Between System Analysis and System Design-

Factors	System Analysis	System Design
Purpose	System Analysis is the process of gathering and analyzing information to assess the suitability of a current system and to determine the requirements of a new system.	System Design is the process of specifying elements of a system such as modules, architecture, components, and their interfaces.
Approach	System Analysis is a top-down approach where the analyst looks at the big picture first and then delves into the details.	System Design is a bottom-up approach where the analyst starts with the details and moves up to the big picture.
Scope	System Analysis focuses on the needs of the user, the current system, and the business processes that the system must support.	System Design focuses on the design of the system, its architecture, and the components that make up the system.
Output	System Analysis produces the requirements document that describes the desired system.	System Design produces the design document that describes the architecture and components of the system.

Time	System Analysis is a one-time process that occurs at the beginning of the project.	System Design is an ongoing process that occurs throughout the project.
Methodology	System Analysis relies on a structured approach such as the Waterfall Model or the Agile Methodology.	System Design relies on an iterative approach such as the Spiral Model.
Tools	System Analysis utilizes tools such as interviews, surveys, questionnaires, and observation.	System Design utilizes tools such as data flow diagrams and object-oriented diagrams.
Process	System Analysis is the first step in the software development process.	System Design is the second step in the software development process.
Goals	The goal of System Analysis is to identify and understand the user requirements and the business processes that the system must support.	The goal of System Design is to create a design that meets the user requirements and supports the business processes.
Risk	System Analysis involves minimal risk.	System Design involves significant risk, as the design may not meet the user requirements or support the business processes.
Problem Solving	System Analysis focuses on problem identification and definition.	System Design focuses on problem-solving and finding solutions.

Answer to the Question no- 2

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.”

Types of System-

The system can be divided into the following types –

- Physical or Abstract System
- Open or Closed System
- Adaptive and Non Adaptive System
- Permanent or Temporary System
- Natural and Manufactured System
- Deterministic or Probabilistic System
- Social, Human-Machine, Machine System
- Man–Made Information System

Systems Models

Schematic Models-

- A schematic model is a 2-D chart that shows system elements and their linkages.
- Different arrows are used to show information flow, material flow, and information feedback.

Flow System Models-

- A flow system model shows the orderly flow of the material, energy, and information that hold the system together.
- Program Evaluation and Review Technique (PERT), for example, is used to abstract a real world system in model form.

Static System Models-

- They represent one pair of relationships such as *activity–time* or *cost–quantity*.
- The Gantt chart, for example, gives a static picture of an activity-time relationship.

Dynamic System Models-

- Business organizations are dynamic systems. A dynamic model approximates the type of organization or application that analysts deal with.
- It shows an ongoing, constantly changing status of the system. It consists of –
 - Inputs that enter the system
 - The processor through which transformation takes place
 - The program(s) required for processing
 - The output(s) that result from processing.

Answer to the Question no- 3

Elements of Data Flow Diagram

Following are the elements of the data flow diagram that are used to represent source, destination, storage and flow of data.

- **Entities:**
Entities include source and destination of the data. Entities are represented by rectangle with their corresponding names.
- **Process:**
The tasks performed on the data is known as process. Process is represented by circle. Somewhere round edge rectangles are also used to represent process.
- **Data Storage:**
Data storage includes the database of the system. It is represented by rectangle with both smaller sides missing or in other words within two parallel lines.
- **Data Flow:**
The movement of data in the system is known as data flow. It is represented with the help of arrow. The tail of the arrow is source and the head of the arrow is destination.

Types of Data Flow Diagram

DFD is of two types-

1. **Logical DFD:**
Logical data flow diagram mainly focuses on the system process. It illustrates how data flows in the system. Logical DFD is used in various organizations for the smooth running of system. Like in a Banking software system, it is used to describe how data is moved from one entity to another.
2. **Physical DFD:**
Physical data flow diagram shows how the data flow is actually implemented in the system. Physical DFD is more specific and close to implementation.

Answer to the Question no- 4

Bottom-up Strategies:

Advantages:

- The economics can result when general solutions can be reused.
- It can be used to hide the low-level details of implementation and be merged with the top-down technique.

Disadvantages:

- It is not so closely related to the structure of the problem.
- High-quality bottom-up solutions are very hard to construct.
- It leads to the proliferation of 'potentially useful' functions rather than the most appropriate ones.

Objectives of Using Structural Flowcharts

- It is most importantly used when programmers make projects. Flowchart is a basic step to make the design of projects pictorially, it is preferred by many.
- When the flowcharts of a process are drawn, the programmer understands the non-useful parts of the process. So flowcharts are used to separate sound logic from the unwanted parts.
- Since the rules and procedures of drawing a flowchart are universal, a flowchart serves as a communication channel to the people who are working on the same project for better understanding.
- Optimizing a process becomes easier with flowcharts. The efficiency of the code is improved with the flowchart drawing.