

Victoria University of Bangladesh

Final Exam - Fall - 2024 - CSI - 314

System Analysis and Design

S.M Mithon Hossen

2121210031

Ans to the Q5 - 1/A

Ans:- System design involves creating a detailed blueprint of a system's architecture, components, modules, interfaces, and data to fulfill specific requirements. It includes outlining a structured plan for building, implementing, and maintaining the system, ensuring it meets functional, technical, and business needs. This process addresses considerations of scalability, performance, security, and usability, aiming to develop an efficient and effective solution.

Ans to the Q5 1/B

Factors

Phase	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 elements of a system such as modules, architecture, components, and their interface.
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.

Ans to the Q5 - 1/A

Ans:- System design involves creating a detailed blueprint of a system's architecture, components, modules, interfaces, and data to fulfill specific requirements. It includes outlining a structured plan for building, implementing, and maintaining the system, ensuring it meets functional, technical, and business needs. This process addresses considerations of scalability, performance, security, and usability, aiming to develop an efficient and effective solution.

Ans to the Q5 1/B

Factors

Purpose	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 elements of a system such as modules, architecture, components, and their interface.
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 users 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.

Ans to the Qs 2/A

Ans:- System is a group of interacting or interrelated elements that act according to a set of rules to form a unified whole. A system, surrounded and influenced by its environments, is described by its boundaries, structure and purpose and is expressed in its functioning.

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

1. physical or abstract systems.
2. open or closed systems.
3. Deterministic or probabilistic systems.
4. man-made information systems.

* physical or abstract systems:- physical systems or tangible entities that may be static or dynamic in operation.

Abstract systems are conceptual or non-physical entities which may be as straightforward as formulas of relationships among sets of variables or models - the abstract conceptualization of physical situations.

* open or closed system:- An open system continually interacts with its environments. It receives inputs from and delivers output to the outside. An information system belongs to this category, since

It must adapt to the changing demands of the user. In contrast, a closed system is isolated from environmental influences. In reality completely closed systems are rare.

* Deterministic or probabilistic systems: - A deterministic system is one in which the occurrence of all events is perfectly predictable. If we get the description of the system state at a particular time, the next state can be easily predicted. An example of such a system is a numerically controlled machine tool. Probabilistic system is one in which the occurrence of events cannot be perfectly predicted. An example of such a system is a warehouse in its contents.

* Man-middle information systems: - It is generally believed that information reduces uncertainty about a state or events. For example, information that the wind is calm reduces the uncertainty that a trip by boat will be enjoyable. An information system is the basis for interaction between the user and the analyst. It determines the nature of relationship among decision makers. In fact, it may be viewed as a decision center for personnel at all levels. There is a class of systems known collectively as computer based information systems. As we have different types of transportation systems such as highway

systems, railway systems and airline systems, computer based information systems are of many types. they are classified as:

- * Transaction processing systems (TPS)
- * Management information systems (MIS)
- * Decision support systems (DSS)
- * Office Automation systems (OAS)

Ans to the Qs 2/B

Ans:- Schematic models

- * A Schematic models is a 2-D chart that shows system elements and their linkages.
- * Different arrows are used to show information 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 relationships.

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 enter the system

* The processor through which transformation takes place.

* The program(s) required for processing

* The output (s) that result from processing

Ans to the Q 3-A

Ans:- Element:- In system analysis, "elements" refer to the fundamental components of a system, typically including input (data received), process (operation performed on data), and output (the resulting information produced); with additional elements like feedback loops which monitor and adjust the system based on the output received.

* External Entities:- These represent entities outside the system boundary that interact with it, like customers, suppliers, or other systems, and are typically shown as rectangles at the diagram's edges.

* Processes:- These represent the system's functions or activities that transform data, shown as circles or rectangles depending on the notation used.

* Data Stores:- These represent where data is stored within the system, like a database or file, and are typically shown as an open rectangle.

* Data flows:- These represent the movement of data between different elements of the system indicated by arrows with descriptive labels.

Data Flow Diagram:- The flow of data in a system or process is represented by a Data Flow Diagram (DFD). It also gives insight into the input and

outputs of each entity and the process itself. Data flow Diagram (DFD) does not have a control flow and no loops or decision rules are present, specific operation, depending on the type of data, can be explained by a flowchart. It is a graphical tool, useful for communicating with users, managers and other personnel. It is useful for analyzing existing as well as proposed systems.

Logical Data Flow Diagram (DFD)

Logical data flow diagram mainly focuses on the system on the system process. It illustrates how data flows in the system. Logical Data Flow Diagram (DFD) mainly focuses on high level processes and data flow without diving deep into technical smooth running of 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.

* Physical Data Flow Diagram:- physical data flow diagram shows how the data flow is actually implemented in the system. In the physical Data Flow Diagram (DFD) we include additional details such as data storage, data transmission, and specific technology or system components. Physical DFD is more specific and close to implementation.

Ans to the Q. 4-A

Ans: The design starts with the lowest level components and subsystems. By using these components, the next immediate higher-level components and subsystems are created or composed. The process is continued till all the components and subsystems are composed into a single component, which is considered as the complete. The amount of abstraction grows higher as the design moves to more high levels.

By using the basic information existing systems, when a new system needs to be created, the bottom-up strategy suits the purpose.

Advantages of Bottom-up:-

* The economies 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. Increase employee motivation. Since the lower levels of a company participate in its decisions, their commitment and level of responsibility increase. By feeling taken into consideration, their motivation and confidence in their future within the company are strengthened.

* Develop productivity:- productivity is related to employee satisfaction. If you improve their experience and make them feel involved in your decision, in addition to offering them the tools they need to perform their work, they will give you the best version of themselves.

* Align company and team objectives. This is essential to retain talent in a company. Finding a balance between the company's expectations and those of its employees reduces employee turnover.

* Boost competitiveness and innovation:- Bottom-up communication facilitates the use of knowledge in the company while the exchange of ideas and creativity, two processes necessary to innovate.

Disadvantages of Bottom-up :-

- * 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.
- * Inability to manage the flood of ideas. This can paralyze decision-making.
- * Risk of disorganization. It can be difficult to maintain consistency between different inputs and teams. This can lead to a dilution of objectives.
- * Need for investment:- Given that this work methodology is collaborative, it will be necessary to allocate resources to tools that facilitate and speed up its implementation, here. Technology is strategic.

Ans to the Q 4-B

Ans:- Objective of structural flowchart: The objective of a structural flowchart is to visually represent a system or process in a structured manner, breaking down complex operations into smaller, manageable components, allowing for easier analysis and understanding, and potential improvement of the process by clearly illustrating the sequence of decisions, actions, and data flow within a system typically following established structured programming principles.

* clarity and organization: - They aim to present information in a logical and organized way, making it easier to follow the flow of a process.

* problem-solving aid: - By visualizing the steps involved, structural flowcharts help identify potential issues or areas for optimization within a system.