

Victoria University of Bangladesh
Dept. of CSE Program:- B.Sc in CSIT
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Design

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Ans to the Q no-1

System design:- System design is a process of creating a design for the system to meet the requirements. System design is the process of designing the architecture, components, modules, interfaces, and data for a system to satisfy the specified requirements.

Differences between System analysis and 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 users, 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 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 data flow diagrams and object oriented di~~

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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 process.

Problem Solving:-

System Analysis focuses on problem identification and definition.

System Design focuses on problem-solving and finding solutions.

Ans to the Q no-2

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

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

Types of system:-

① Physical or Abstract system:- Physical system is a tangible entities that may be static or dynamic in nature. Abstract system is conceptual or non-physical. The abstract is ~~is conceptual or non-~~ conceptualization of physical situations.

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Open and closed: - An open system continually interacts with its environment. It receives input from the outside and delivers output to outside. A closed system is isolated from environment influences.

Sub system and Super system: - Each system is a part of a large system. The total system consists of all objects, attributes and relationship necessary to accomplish an objective given a number of constraints. Sub systems are the smaller systems within a system. Super system denotes extremely large and complex system.

Permanent and Temporary System: - A permanent system is a system enduring for a time span that is long relative to the operation of human. Temporary system is one having a short time span.

Natural and Man made system: - System which is made ~~man~~ by man is called man made system. Systems which are in the environment made by nature are called natural system.

Man-made Information System: - It is generally believed that the information reduces uncertainty about a state or event. An information system is the basis for inference -

tion between the users and the analyst. It determines the nature of relationship among decision makers.

System model:-

System modelling is a process of developing abstract models of a system, with each model presenting a different view or perspective of that system.

System modelling helps the analyst to understand the functionality of the system and models are used to communicate with customers.

Models of the existing system are used during requirements engineering. They help clarify what the existing system does and can be used as a basis for discussing its strengths and weaknesses. These then lead to requirements for the new system.

Models of the new system are used during requirements engineering to help explain the proposed requirements to other system stakeholders. Engineers use these models to discuss design proposals and to document the system for implementation.

In a model-driven engineering process, it is possible to generate a complete or partial system implemen-

tation from the system model.

System modelling has now come to mean representation a system using some kind of graphical notation, which is now almost always based on notations in the Unified Modelling Language (UML).

Different models present the system from different perspectives —

- External perspective showing the system's context or environment.
- Behavioural perspective showing the behaviour of the system.
- Structural perspective showing the system or data ~~set~~ architecture.

Ans to the Q no - (3)

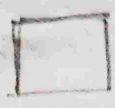
Data Flow Diagram (DFD) is a graphical representation of data flow in any system. It is capable of illustrating incoming data flow, outgoing data flow and store data.


Data flow diagram describes anything about how data flows through the system.


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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

 External entity

 Process

 Output

 Data flow

 Data store

① Entities:- Entities include source and destination of the data. Entities are represented by rectangle with their corresponding names.

② Process:- The tasks performed on the data is known as

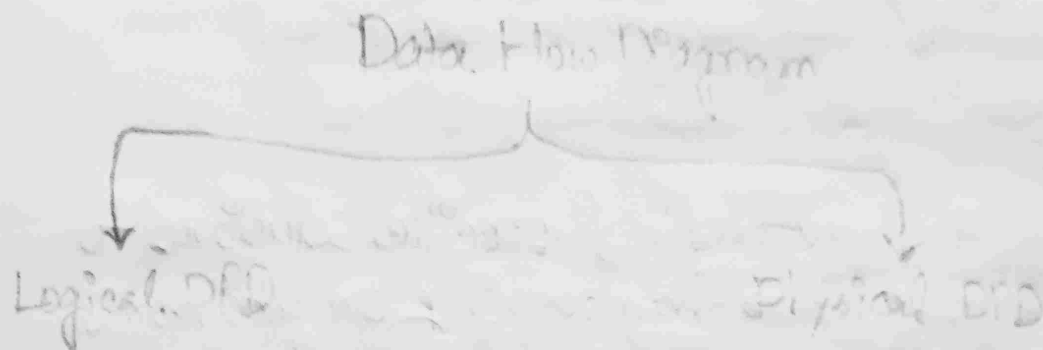
the process, Process is represented by circle.

③ 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.

④ 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 ~~dest~~ destination.

Types of DFD:- 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~~ 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.

Ans to the Q no-4

Bottom-up strategy advantage disadvantage:-

Advantages:-

- ① It allows for the development of specific solutions to specific problems, rather than relying on abstract ideas. This can lead to more practical and effective solutions.
- ② It is a more incremental and incremental approach, which can make it easier to implement and test changes.
- ③ It can be more flexible and ~~etc~~ adaptable, as it allows for the incorporation of new information and the modification of solutions as needed.
- ④ It is ~~more~~ often more efficient, as it focuses on the most fundamental and necessary components first, rather than trying to build a complete system all at once.
- ⑤ It can be more reliable, as it is based on a solid foundation of well-understood and tested elements.

Overall, a bottom-up approach can be useful in certain ways but it has some disadvantages as following:-

Disadvantages:-

- ① It can be time-consuming.
- ② It can be inflexible.
- ③ It may not always be the most efficient method.
- ④ It can be difficult to coordinate.

Objectives of using structural flowcharts:-

This preference stems from the fact that flow charts enable ~~eases~~ easier comprehension and generate fewer errors in human perception. The structured flow chart helps the mission to create new algorithms by encapsulating a range of data points inside an interlinked illustration.

A structured flowchart is one in which all of the processes and decisions must fit into one of a few basic structured elements.