

# Enterprise System Engineering

## BS-SE (13)

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### Question 1:

**Answer:**

**Goals of enterprise design methodology:**

- Identifying Stakeholders needs and strategy to solve them:
  - How to generate solutions to the problems identified.
  - How to evaluate the proposed solutions
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### Question 2:

**Answer:**

**Strategy initiated project:** A project performed by a charity organization in fort lauderdale, florida provides an example of an enterprise design project that was done to implement a strategic vision. The charity provides food for the poor elderly citizens of the city. A question was asked of them if they provide fresh produce. The answer was that they currently did not have capability but provision of fresh produce was part of their strategic vision.

**Subsystem design:** Example: A company that is entering the asian market for the first time might need to design the entire asian division including the organization information systems and Processes.

**Re-engineering projects:** Example:Fast food Company: Completely redesigning the delivery of products can give you unexpected results. In this type of restaurant, the process goes like all others, the customer orders, the order goes to the kitchen, which prepares the meal and then delivers to the consumer.

**Supply chain Project:** Example: TSC and daraz.pk

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### Question 3:

#### Answer:

#### Sequential Vs Random Access Files:

- Sequential access files allow sequential operation. (Read, write & Search).
- Efficient for report writing
- Searches are not efficient because an average of 50% of records have to be accessed.
- Two Types: Unordered And Ordered

#### Random Access Files:

- Random access files allows random files operations
- Good for finding and updating a specific object.

Transaction files hold information that can be used to update master files. Whereas master files, core information that is important to the business such as orders information.

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### Question 4:

#### Answer:

#### Features Of Model: Purpose:

- Determines what aspects of the system's features and behavior need to be represented in the model and what aspects can be omitted.
- Identified by a modeler
- Mercator's projection to Earth
- Is it incorrect?
- No because the purpose is different: It is used for navigation
- Abstraction

#### Types of Models:

##### Non-Analytical Model:

- Descriptive models that show a static view of the system at a point in time.
- Flowcharts, organization charts, data models

##### Analytical Model:

- Described using mathematical terms
- Deterministic Models.
- Stochastic models : Random variables

##### Computational Model:

- Exploit the capability of computers to perform calculation rapidly so that the model can represent the time varying behavior of system

- Deterministic models
  - Stochastic: Random variables
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**Question 5:**

**Answer:**

**Operation Research:** The field of operations research uses math to solve problems. A cornerstone of the operation research is optimization.

Steps:

- Formulate the problem
- Defining the decision variables, objective function and constraints
- A search algorithm is used to find the optimal solution.

**Complex vs Wicked Problems:** Complex are the solution space grows exponentially, Computationally very complex to find a best solution and they can be well defined as well as ill-defined problems.

Wicked problems are complex and they are ill-defined. To address wicked problems: Simons's bounded rationality

**Is enterprise design a wicked problem? Why? :** There is no definitive statement of the problem, each stakeholder has a different perspective of the problem and all are right. There is no definitive solution and therefore no stopping rule so the design process could go on indefinitely. To understand the problem the designer creates a solution and therefore gains greater knowledge about the problem and then can generate another solution.

**Design for Change:** Close to the market, flexible, quick and efficient information flows. Decentralized decision making, High employee autonomy and willingness to innovate.

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**Question 6:**

**Answer:**

Seven lifecycle phases, each phase is delimited by milestones, Each phase has one or more activities and generates one or more deliverables. Some milestones are deliverables: Project plan

Some milestones are meetings or events that mark the end of a phase.

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**Question 7:**

**Answer:**

**Causal Loop Diagrams:**

- Depicts a system as an interrelated system of variables.
- The purpose of causal loop diagrams is to depict beliefs about the causal structure of the system.
- Elements:
  - Nodes => system Variables
  - Arcs => relationship between variables.

**Stock And Flow Diagrams:**

- Views the system as Stocks
  - Accumulation of things
  - Materials, money, information objects and people
- Flows

**Patient Appointment Booking Diagram:**

